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STEEL

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FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

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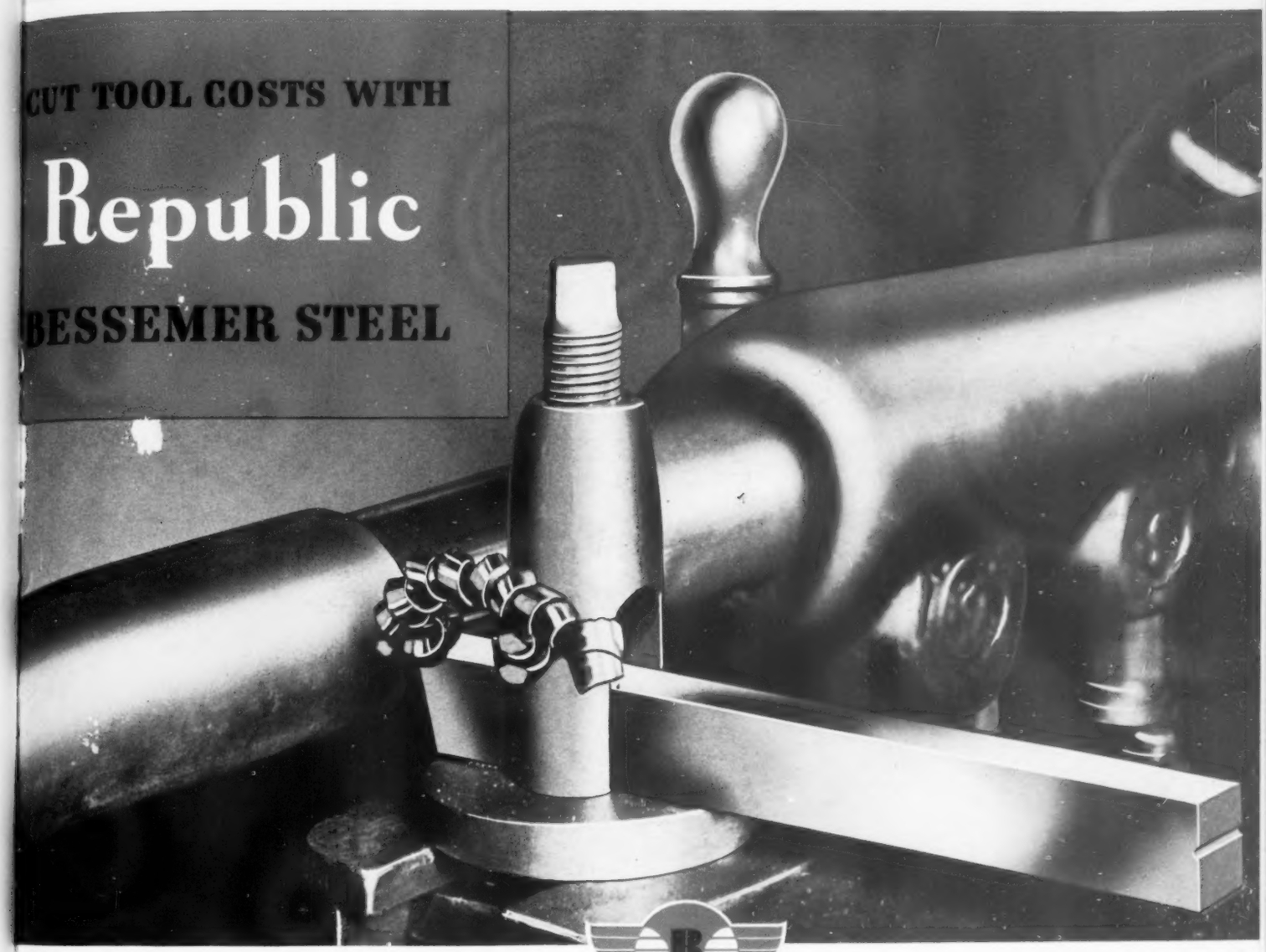
Republic

BESSEMER STEEL



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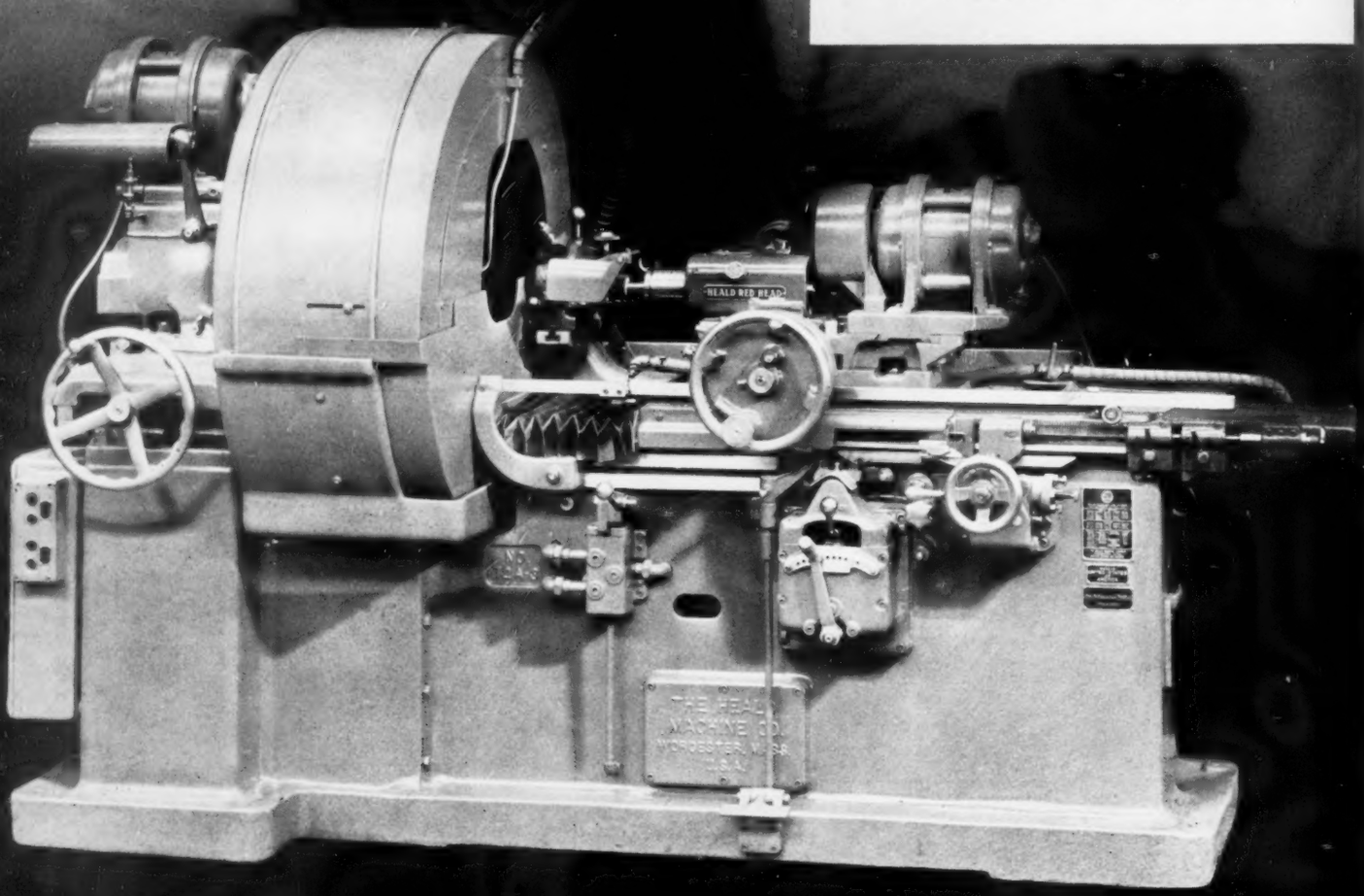

STEEL

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For forty-eight years—IRON TRADE REVIEW

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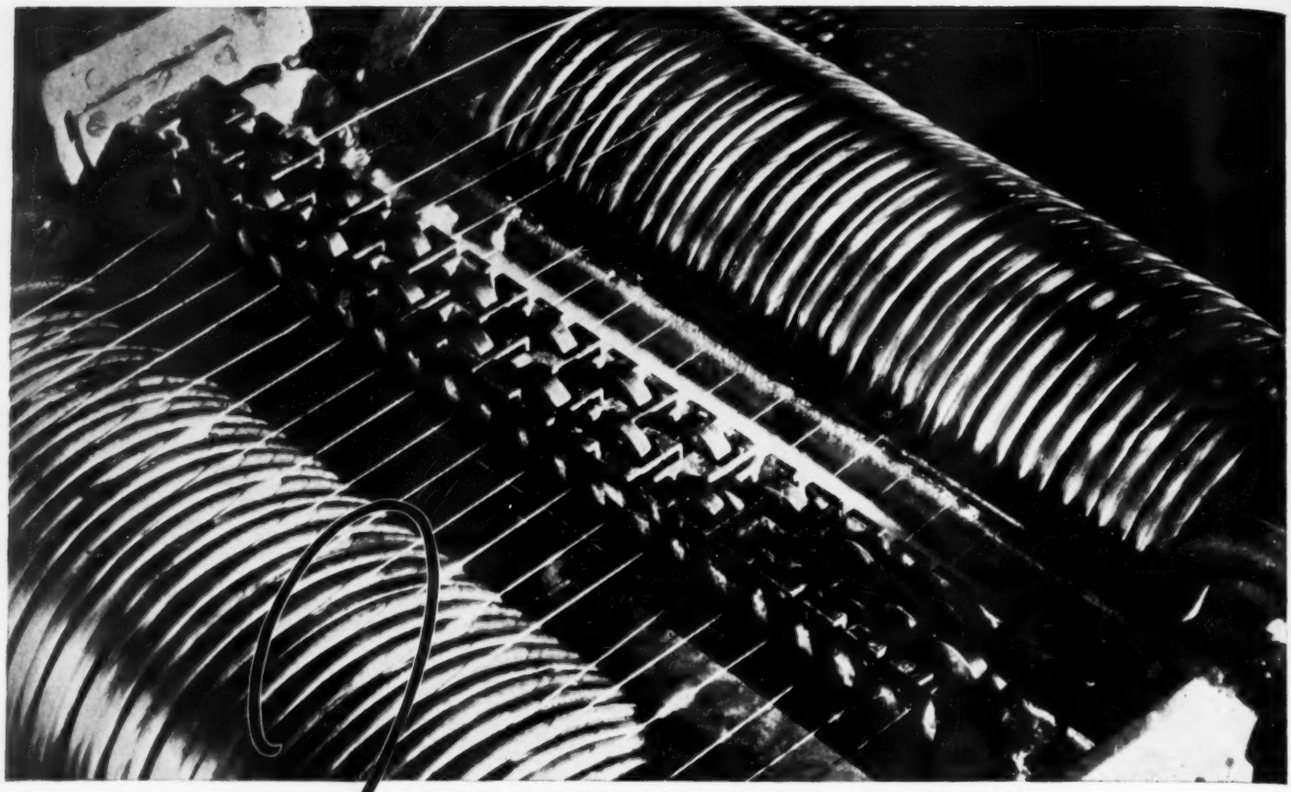

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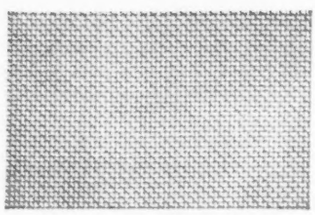
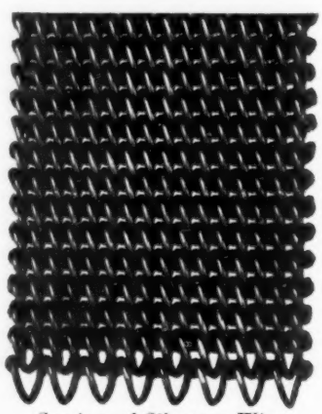


Silcrome Double Crimped Wire Cloth



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As the Editor Views the News

THAT emphatic declaration of independence which 323 members of the house of representatives gave to the American public last Tuesday is of great significance to industry. It means that from now on at least one house of congress will cease to be a willing tool of vindictive new dealers in their punitive campaign against business. Moreover, in determining to investigate the lobbying tactics of brain trusters, the house turned the spotlight upon a situation which has been responsible for much unnecessary misunderstanding between members of congress and representatives of industry. Curbing the arrogance of anti-business advisers to the President will have a wholesome effect.

• • •

Wagner Act Is One-Sided

In signing the Wagner labor disputes bill, President Roosevelt put into effect a law which will cause untold trouble to employer and employe. His statement that "a better relationship between labor and management is the high purpose of this act," would be easier to understand if the authors had drafted the bill in a spirit of fair play instead of in an atmosphere of vindictiveness toward employers and of animosity to employe representation plans. Because it was written in spite and for the purpose of elevating a minority labor group to undeserved power, it will fail of its own one-sidedness.

• • •

Go Slow on Agreements!

Industry goes into the second half in a stronger position (p. 28) than it occupied a year ago. Then activity declined abruptly; this year the interruption caused by the holiday is less pronounced and the rebound, from present indications, will be more encouraging . . . . Voluntary agreements by industrial groups, designed to take the place of old NRA codes, will fall under the jurisdiction (p. 23) of the federal trade commission. This simply reinstates a procedure which was in effect long before the new deal was launched . . . . Industrial executives are cautioned by representatives of the government, as well as by spokesmen of private business interests, to go slow in entering into such agreements. This is sound advice (p. 27). Experience of the past two years shows conclusively that undue haste in adopting improperly considered plans has caused industry much unnecessary grief.

• • •

Sales Talk With a Punch

When we asked a prominent machine tool builder of Cincinnati to comment on the subject "To Buy or Not To Buy?", he countered (p. 36) with the questions: "Is that the real question users of machine tools face today? Is it not rather 'To Buy Now or To Buy Later?'" Whereupon he lists six important advantages which will be lost by manufacturers who postpone the replacement of obsolete or inefficient equipment. This well known authority also makes the point that improved machines of 600 different types will be shown at the machine tool show in Cleveland in September and predicts that "such an era of development will not be repeated for many years." He makes a strong case for prompt action on modernization!

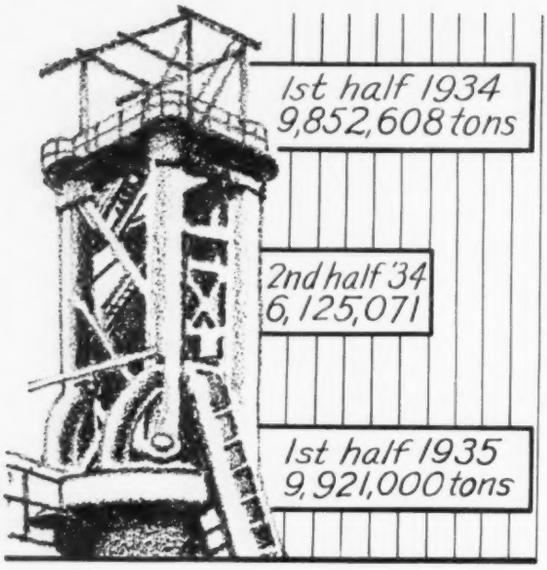
• • •

A Toast for a Real Pioneer

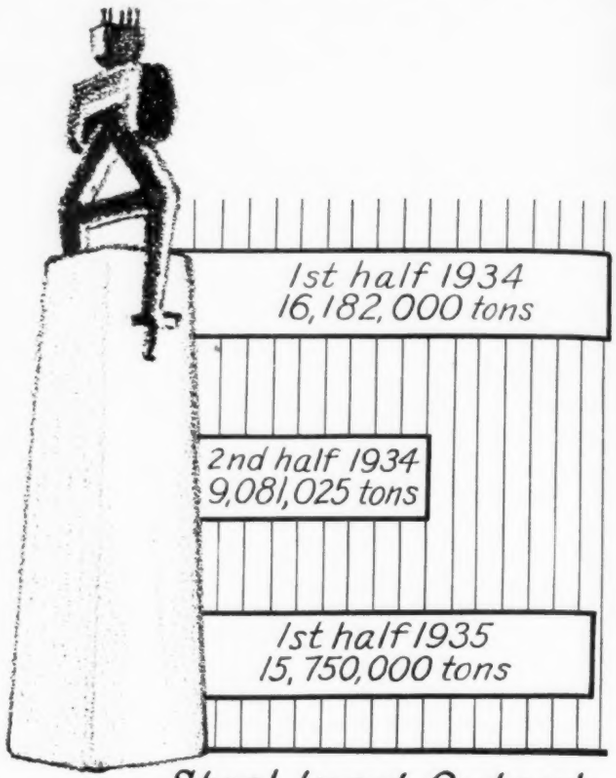
Few companies in any branch of industry can look back upon an unbroken existence of 100 years. All the more remarkable, therefore, was the celebration last Tuesday of the 125th anniversary of the Lukens Steel Co., when the community of Coatesville (p. 17) tendered a testimonial banquet to veteran employes of the company. The attainment of the ripe age of a century and a quarter, in itself, is a high tribute to the quality of management and the ability and loyalty of employes which have characterized the growth of the Brandywine mill of 1810 to the extensive furnaces, mills and fabricating shops of Lukens Steel of 1935.

E. L. Shaner

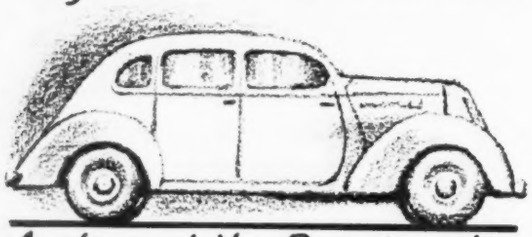
How the First-half 1935 Compares with 1934



Pig Iron Production

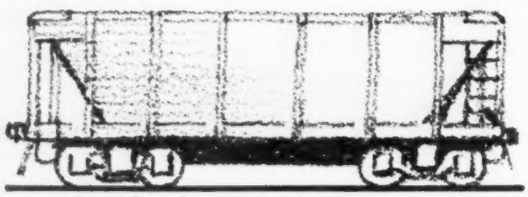


Steel Ingot Output



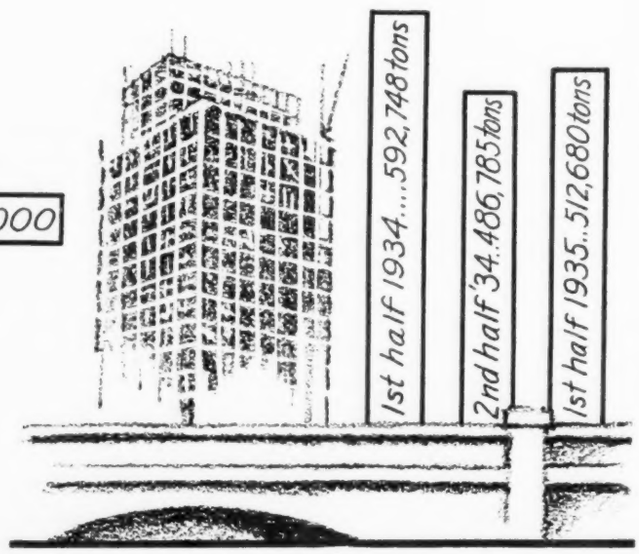
Automobile Production

1st half 1934.....1,714,263
2nd half '34 1,038,848
1st half 1935.....2,240,000



Freight Car Awards

1st half 1934.....23,259
2nd half 1934.....570
1st half 1935.....6,309



Shape and Concrete Bar Awards

Rail Orders

1st half 1934.....458,698 tons

2nd half 1934.....50,423 tons

1st half 1935.....224,219 tons

Toledo vs. Detroit in Freight Advantage Fight

SINCE September, 1933, steel consumers in Toledo, O., have seen trainloads of steel from Pittsburgh move through their city and on to Detroit, where the Detroit consumers have paid less for that steel, delivered, than the price paid by the Toledoans for the same steel, delivered in their city.

Last week, through the Toledo chamber of commerce, they let loose a broadside at the steel manufacturers for their "discrimination" against Toledo and in favor of Detroit. Copies of briefs summing up the situation were filed with the steel producers. Unless something is done, consumers intimate, aside from their briefs, the complaint will be carried to the federal trade commission.

Some 50 industries in Toledo use steel, and are consuming approximately 300,000 tons this year. Toledo is not a basing point for steel, and buys most of its material on a Pittsburgh base. Practically all these consumers manufacture products for the Michigan automobile industry, and these pay about $2,000,000 in freight on accessories, parts and other products shipped to Michigan.

They enjoyed a natural advantage in being closer to sources of steel, which enabled them to pay this freight.

Absorbs Part of Freight

In 1933, however, they say (not in their brief) that General Motors and some other large automobile manufacturers threatened to build their own steel mills in Michigan unless the steel industry granted some concession in price which would enable them to meet the Ford situation.

Steel manufacturers did not cut their base price, but in September, 1933, adopted Commercial Resolution No. 21, which had the same effect. Under this resolution they absorbed some of the freight to Detroit —but none to Toledo.

The actual Pittsburgh - Detroit freight rate on sheets, strip, bars is 26½ cents per 100 pounds. Sellers absorbed 6½ cents of this, giving the Detroit consumers a rate of 20 cents. The actual Pittsburgh-Toledo rate remains 23½ cents. On this basis alone, Detroit users have paid 70 cents less per ton, than Toledo.

The same formula is used in determining the deductions at Michigan points outside the Detroit switching district, except that the deductible factor varies.

Sheets, strip and bars are the products most generally affected, but precisely the same formula is used in determining the amount of deduction on other articles on the steel list, the only difference being in the deductible factor, which is variable. In their brief, the Toledo consumers state:

"No claim may be substantiated that in granting such concessions on steel prices at Toledo as obtain at Detroit, Detroit industries will be injured. We therefore say unequivocally that the least that may be done to remove the inequities in the present situation is to grant to Toledo consumers the same concessions in delivery prices as are being granted within the Detroit switching limits.

Compete with Detroit Plants

"We have in the foregoing paragraphs stated that many of the Toledo industries, consumers of iron and steel in large quantities, and particularly those plants manufacturing automobile parts and equipment, must compete with industries of a similar nature located in Detroit and other cities in lower Michigan. That competition has always been severe because even though all other factors were equal, the industries in Toledo have had a greater freight cost to consider in making quotations on an f.o.b. destination basis.

"We have likewise pointed out that because of our more favorable location with respect to the raw steel, Toledo for many years has, and does now, enjoy a lower rail freight rate on such material; and that factor of lower freight costs on raw materials has been a dominant one in enabling Toledo industries to obtain a fair share of the automotive parts and equipment business.

"It must be generally understood we think, that in the past few years competition in the automotive parts and equipment business has been increasingly keen and quotations on an f.o.b. destination basis have been on an exceedingly narrow margin. So narrow in fact that many Toledo industries cannot continue to operate much longer except at a loss, or with little or no margin of profit, if they must continue to absorb the unnatural and arbitrary differences in delivery prices on iron and steel articles, such as are now being made by the mills to competing industries in Detroit and the Detroit area.

Unfair Discrimination

"There can only be one inevitable result if this inequitable practice is continued. There must follow sharp decreases, or complete losses, insofar as contracts may be concerned, with a resultant heavy loss in employment.

"We are faced then with the anomalous situation of an agency of government which is by direct sanction of certain code practices calculated to insure—though by an artificial process—lower prices to one community, contributing to the economic destruction of another community, thereby creating unemployment and adding to a relief burden which even now is well nigh intolerable.

"It is our further thought, in view of the recent decision of the United States Supreme Court bearing on the constitutionality of certain phases of the national recovery act, that it might be pertinent to inquire as to the authority for the continuance of Commercial Resolution No. 21.

"It is our considered opinion that the resolution is completely at variance with the principles enunciated in Section 2 of the Clayton antitrust act, which says in effect that it shall be unlawful to discriminate in price between different purchasers of commodities where such differences would result in substantially lessened competition, or would tend to create a monopoly."

◆

An angle "shot" of the South tower of the new Golden Gate bridge at San Francisco. Acme photo

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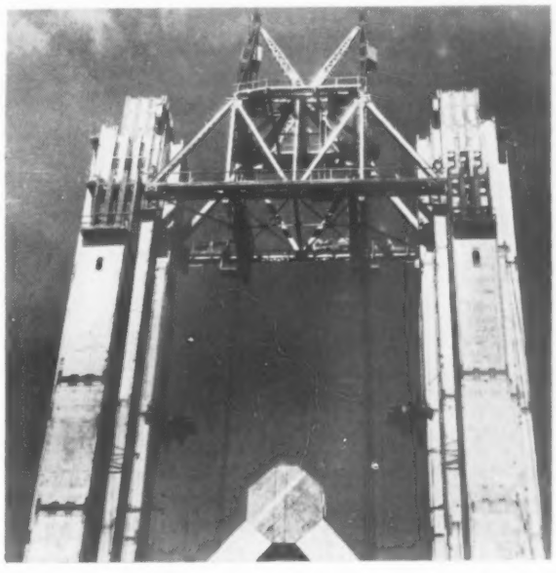


Beer Cans Opening Million Ton Market for Tin Plate

WITH the increasing adoption of tin plate for the packaging of beer for home and restaurant consumption, as reflected by reports set forth on this page, attention is focused on the tonnage potentialities of this new steel application.

While the new development has been under way for the past two years, it has taken tangible form only recently. The first brewery to make use of the new package, as recounted in STEEL, Feb. 25, 1935, page 36, and March 25, 1935, page 29, was the Kreuger Brewing Co., Newark, N. J., which at that time had begun marketing beer in "keg-lined" tin plate cans made by the American Can Co.

Favorable Reception in South

At first the new package was placed on the market at Richmond, Va., and so successfully did it attract patronage that it now is being offered in North Carolina and West Virginia. The container used has capacity for 12 ounces and is marketed in 24-unit cartons. Along with these packages goes a special steel opener which, at one stroke, cuts a triangular opening in the top of the can.

Estimates as to the potential market for tin plate in the manufacture of beer cans vary widely, in some cases up to 3,000,000 tons a year. It seems more likely that 1,000,000 is a representative and conservative figure.

Possibilities are indicated by the requirements of the Premier-Pabst Corp., which markets about 40 per cent of its beer in bottles. This requires about 130,000,000 bottles or cans of 12-ounce capacity which, if cans are used entirely, will consume about 1500 tons of tin plate.

Many other breweries are giving serious consideration to the new packaging method. The Fort Pitt Brewing Co., Pittsburgh, is reported swinging over to the use of tin plate.

Public Reaction Is Key

The speed with which the new package attains general adoption depends on two factors. The major one is the reception which will be given to the new package by the public generally. While this has been all that could be desired in the territory having Richmond, Va., as its focal point, the reception to the Pabst and other cans in the country generally will be studied carefully by the brewing industry. It seems likely that by the late fall or winter, impressions as to the marketing desirability of the new can will have been crystallized.

The other factor is the expense involved. Owing to the comparatively recent legalization of beer, the breweries so far have been unable to enjoy any great earnings on the huge investments which they have made. Existing heavy investments in glass bottles and shipping cases, glass bottle washers, pasteurizing equipment and miscellaneous equipment incidental to glass bottles likely will prevent so rapid adoption of the tin plate beer can as readily as might otherwise be expected. Scrapping of bottles not only will mean the loss of this investment but will necessitate large expenditures for the new machinery required to fill and seal the cans.

Pasteurizing Not Necessary

Can manufacturers advance many strong sales claims for the new beer can, arguments which appear to be substantiated by the experience of the Kreuger Brewing Co. and by the adoption of the new container by the Premier-Pabst Corp. Canned beer does not need pasteurization. In the cans, which are lined with a suitable pitch, the beer is maintained under pressure of 80 pounds, so that beer issuing from the cans, it is said, has the same palatability as draft beer.

In appearance, the beer can is neat and attractive. The Kreuger cans are lithographed in three colors for beer —red, black and yellow—and for ale —green, black and yellow. These cans are 4¾ inches deep and 2⅝ inches in diameter and can be packed much more compactly in a refrigerator than bottles. The new containers are used only once, a factor of great hygienic value. They prevent entirely the deteriorating effect on beer of exposure to light. They eliminate the bottle deposit nuisance.

Whittle at Can Costs

The cost of the tin container has not yet reached a point where it can undersell glass. For a 24-unit case of 12-ounce cans, completely lithographed, soldered and ready for shipment, the cost, exclusive of content, is about 60 cents, or 2½ cents per can. Can makers hope to reduce this cost to 2 cents. This matter of cost is a distinct factor in view of the fact that most popular brands of beer now sell at $1.80 to $2 a case.

From a weight saving angle, tin beer cans offer a saving in transportation costs. The weight of two 24-unit cases of canned beer is the same as that of a conventional wooden case and 24 glass bottles, the beer content being the same in each case. In other words, with cans there is twice as much beer for the same weight.

Growing market for tin plate is indicated by adoption of tin cans for packaged beer

Continental Plans Machinery For Making Beer Tins

Continental Can Co. Inc., New York, announces that it now is building machinery for the manufacture of beer cans out of tin plate. This move is the result of development work over the past two years, during which period successful results have been obtained with experimental tin plate packs in various breweries.

The company expects to have two types of cans available for the packing of beer, one to be similar to the standard packer's can used for fruits and vegetables and the other having a cone shaped top with cap similar to that used on glass beer bottles. Manufacture of these new beer cans is expected to be on a production basis by Sept. 1.

Pabst Goes to Cans

Premier-Pabst Corp., Milwaukee, formerly Pabst Brewing Co., announces a new policy of packaging beer for home consumption in 12 ounce cans made from tin plate. It has contracted with the American Can Co., New York, for its supply of cans and now is installing special machinery for filling and closing cans.

Coatesville Celebrates 125th Anniversary of Lukens Steel

ON JULY 2, 1810, a deed was recorded in Chester county, Pennsylvania, destined to become of historical interest in the iron and steel industry.

It marked the transfer of land and sawmill on the Brandywine at Coatesville, and fixed the date of the founding of the Lukens Steel Co., which now operates on the site the largest plate mill in the world.

On July 2, 1935, the city of Coatesville, in observance of the 125th anniversary of this event, tendered a testimonial banquet to the 235 employes of the company whose records of continuous service embraced 25 years or more.

The banquet, at which nearly 400 townspeople, officials and veteran employes of the Lukens companies, and guests were present, was held in the auditorium of the Coatesville Y. W. C. A. Mayor William G. Gordon presided as toastmaster.

In the principal address of the evening, C. L. Bardo, Camden, N. J., president, National Association of Manufacturers, emphasized the importance of harmonious labor relations and congratulated the management and the employes of Lukens for having maintained, through 125 years of the continuous existence of the company, the satisfactory employer-employe relationships which are so essential to the success of a business enterprise and to the welfare of the community.

Charles L. Huston, first vice president, Lukens Steel Co. and great grandson of its founder, described numerous interesting incidents in the early days of the company's history and introduced a number of employes with unusually long records of service.

Robert W. Wolcott, president, Lukens Steel Co., spoke briefly, expressing on behalf of the company its appreciation of the congratulations received from many quarters on the occasion of the anniversary and of the spirit of the community of Coatesville, as demonstrated by its action in honoring the company's veterans. William H. Martin, 50 years in Lukens' service, in a brief address, expressed the appreciation of Lukens' employes.

J. H. Van Deventer, editor, *The Iron Age*, New York, and E. L. Shaner, editor of STEEL, Cleveland, commented briefly on the significance of the event.

THE story of Lukens starts with three characters — Isaac, Joseph and Rebecca. In 1780 Isaac Pennock, son of Joseph, a prosperous farmer, struck out from his father's home to start an iron forge at Rokeby, on Buck Run, four miles from Coatesville. He had seen blacksmiths take iron blooms from nearby charcoal furnaces and pound them into shape on an anvil for use by farmers. He had muscle, and imagination.

Joseph, however, lamented that Isaac "should leave a good farm with wheat $1 a bushel, to enter the hazardous business of iron manufacture." So little faith had he in his son's judgment that he put Isaac's inheritance in trust for him.

By 1810 Isaac had become successful. He had started the Federal Slitting Mill where iron was pounded into plates and then slit into handy sizes for general blacksmithing. In this year he returned to Coatesville, bought the sawmill, converted it into an iron mill, and christened this the Brandywine Rolling Mill & Nail Factory. The rolls were about 16 inches diameter and 3 to 4 feet long. When the Brandywine was too low to turn the water wheel his helpers jumped on the spokes.

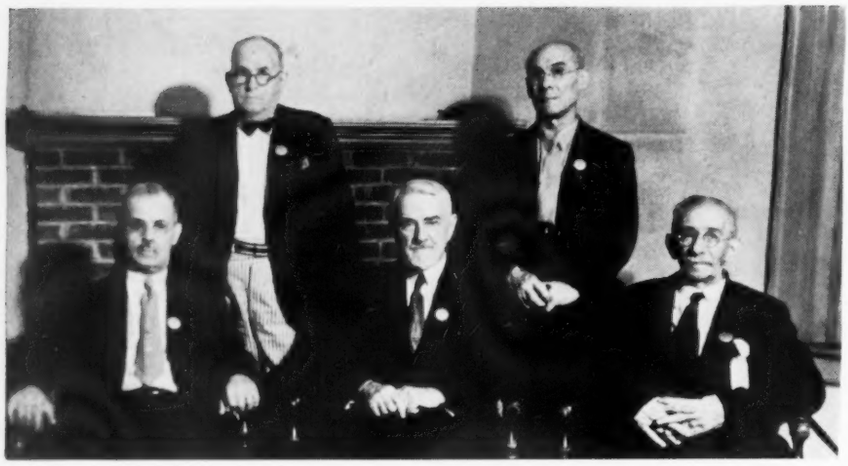
In 1812 Dr. Charles Lukens, Philadelphia physician, married Isaac's daughter, Rebecca, and moved to Coatesville. In 1817 he leased the mill at $420 a year from Isaac, and when Isaac died, he contracted to buy it from the heirs.

Steam power was coming into use. There was a demand for boiler plate and Dr. Lukens improved the equipment. The sailing vessel SAVANAH, with a steam engine and boiler this year crossed the Atlantic, part way under steam — the first to make the trip.

In 1825 a heroic figure came to the front. Rebecca, aged 31, mother of four children, took charge of affairs. She carried out the doctor's unfinished plans. She managed every detail of the business; fought to retain water rights; led a procession of her mill men in a campaign for a tariff; carried apples in her apron from an adjoining farm to her workmen. In nine years she had paid off the heirs and creditors.

In 1849 Dr. Charles Huston, a physician of Philadelphia who married

A view of the speakers' table at the banquet in Coatesville, July 2, the 125th anniversary of Lukens Steel Co. C. L. Bardo (standing), president of the National Association of Manufacturers, was the principal speaker. On Mr. Bardo's right are seated, in order, Robert W. Wolcott, president of Lukens; J. H. Van Deventer, editor of THE IRON AGE, *G. M. Gillen, sales promotion manager of Lukens; and E. L. Shaner, editor of* STEEL. *On Mr. Bardo's left are seated Mayor William T. Gordon, Coatesville; C. L. Huston, first vice president of Lukens; and William H. Martin, representative of Lukens employes*



Lukens men with 280 years of service photographed at the 125th anniversary banquet of Lukens Steel Co., given by the city of Coatesville. These five men are the oldest employes in point of service. Reading from left to right, seated, Samuel H. Forbes, 51 years, C. L. Huston, first vice president, 60 years, John Trupe, 62 years; standing, left to right, David Gilbert, 57 years, Edward Walker, 50 years

Rebecca's second daughter, Isabella, gave up his practice to help "Mother" Lukens manage the plate mill, and began a connection with the company which extended for 50 years.

In 1854 Rebecca, then 60, died. A little while before her death she had written—what might be part of her memoirs: "Not a vestige of the old mill remained . . . I had built a very superior mill, though a plain one, and our character for making boiler iron stood first . . . hence we had as much business as we could do."

AFTER Rebecca Lukens' death the mill passed to Dr. Huston and Abraham Gibbons, another son-in-law, who following a short connection with the company retired in 1855.

The management fell to Dr. Huston, and he, with a partner, Charles Penrose, conducted the manufacture of iron until the latter's death in 1881. In 1872 and 1875, respectively, upon completion of their college courses, the sons of Dr. Huston, A. F. and C. L., the latter still first vice president, became associated with the business. Robert W. Wolcott, the present president, is the husband of the great-great grand-daughter of Isaac Pennock.

It was to honor Rebecca Lukens, fully as much as to avoid confusion with another iron mill three miles up the Brandywine, that the name of the Brandywine Rolling Mill & Nail Factory was changed to the Lukens Rolling Mill shortly after Rebecca died.

This name subsequently became Lukens Iron & Steel Co., and in 1916 the company was incorporated as the Lukens Steel Co. The company really has three divisions at Coatesville—Lukens Steel Co., By-Products Steel Corp., formed in 1926, and Lukenweld Inc., organized in 1928 to promote the use of rolled steel by welding in the construction of machinery.

It was during the half century that Dr. Huston presided over the company's affairs that the water-driven iron mill was transformed into a modern steel rolling plant.

The tradition—"our character for making boiler plate stood first"—motivated him in all that he did to improve equipment and product.

When in 1873 the United States government began to require that plates used in construction of steamboat boilers should be stamped with their tensile strength, Dr. Huston promptly installed a testing machine and entered upon a thorough investigation of the physical properties of iron.

In 1877 when the makers of boiler plate were requested by the treasury department to send a committee to Washington to advise with the board of supervising inspectors of steamboats in framing a proper standards of test, Dr. Huston was chosen chairman, and his recommendations were adopted. His counsel was sought and followed by the government, the leading steam boiler inspection and insurance companies.

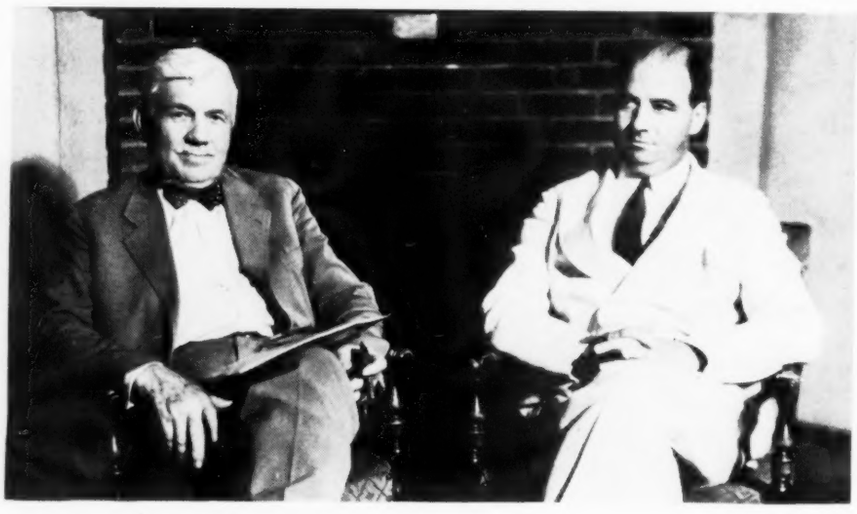
Introduce Steam in 1870

The water wheel was supplanted in 1870 with a steam plant, and the rolls were increased in size to 25 x 84 inches. The first Lukens steel plate was rolled in 1880. In 1890 a three-high mill was installed, rolls 34 x 120 inches, the largest in use at that time in this country. The following year the company began pouring steel from its first open-hearth furnace.

In 1899 a 48-inch universal mill was added, with a capacity for making plates with rolled edges from 8 inches up to 48 inches wide, and in lengths over 100 feet. In the same year a new open-hearth steel plant with six 50-ton furnaces was built. Three years later a massive slab mill was installed, second to none in the country at that time, either in size or design.

In the summer of 1903 another large mill was added to the plant, equipped with rolls 140 inches long. At the time of its installation this mill had a capacity for rolling the widest plates of any in the United States.

Time after time the plant and its equipment were enlarged. The Hustons were credited with originating the spinning of heads and the



Robert W. Wolcott, right, president of Lukens, and Clinton L. Bardo, left, president of National Association of Manufacturers, photographed at the testimonial banquet to the 235 Lukens employes with 25 or more years of continuous service with company, a total of nearly 80 centuries of service. The occasion was also the 125th anniversary of the Lukens company

flanging of steel by machinery. The company now makes elliptical steel heads 13 feet in diameter, 2½ inches thick, and weighing approximately 12 tons.

Its "world's largest plate mill" has rolls 206 inches wide. These rolls can open up 41 inches, take an ingot weighing 90,000 pounds, and can roll plates weighing up to 50,000 pounds.

From the Lukens plant comes an endless variety of plates and plate specialties, essential to many industries.

Meetings

COMMITTEE on blast furnaces and raw materials of the Iron and Steel division of the American Institute of Mining and Metallurgical Engineers is arranging for a session on the subject of beneficiation of iron ores, of fluxes, and of the air-blast, at the time of the National Metal Congress in Chicago next October. This session will be held the morning of Oct. 1, second day of the congress.

Papers on the beneficiation of iron ores, the preparation of blast furnace flux stone, and on reducing waste due to nitrogen in the atmospheric air-blast are in preparation. Blast furnace men, whether or not members of A.I.M.E., are invited to attend.

RATE OF OPERATION

(Relation of Production to Capacity)

	1935[1]	1934[2]	1933[3]	1932[4]
Jan.	34.2	28.3	13.3	22.1
Feb.	41.4	32.5	14.3	23.4
Mar.	41.0	37.5	12.7	22.0
Apr.	40.0	41.4	15.1	20.2
May	40.2	47.5	20.9	17.9
June	37.2	46.3	30.6	14.7
July	.....	28.4	42.4	13.0
Aug.	.....	24.5	42.8	12.0
Sept.	.....	21.5	36.4	14.0
Oct.	.....	22.1	31.8	14.7
Nov.	.....	22.8	26.2	14.7
Dec.	.....	23.7	27.9	12.5

[1]Based on capacity of 50,845,741 gross tons, Dec. 31, 1934; [2]capacity of 50,975,561 tons, Dec. 31, 1933; [3]capacity of 50,313,975 tons, Dec. 31, 1932; [4]capacity of 51,598,175 tons, Dec. 31, 1931. Capacities by American Iron and Steel institute.

CHICAGO SCRAP MEN GOLF

Chicago chapter of the Institute of Scrap Iron and Steel Inc. held its annual golf tournament at the Idlewild Country club, June 28. About 30 attended the dinner held following the tournament. First prize in the golf match went to Everett B. Michaels, Hyman-Michaels Co., with Frank Garrett, Briggs & Turivas, second. The next three winners were Harry Harris, Northwestern Iron & Metal Co.; R. C. Heune, Ohio Iron & Metal Co., and Arthur L. Jeffery.

First Half Iron Output Below 1934; June Drop 7 Per Cent

DESPITE the stronger start of 1935 over 1934, production of coke pig iron in the United States during the first half of this year fell a little short of the output of the first six months of last year. In 1935, production amounted to 9,829,934 gross tons, against 9,852,608 tons for the corresponding period of 1934, the loss being 22,674 tons, or 0.22 per cent.

Five more blast furnaces were removed from operation in June, dropping the active total from 96 on May 31 to 91 on June 30, and thereby decreasing production to the lowest point since last January. It is to be recalled that in June, one year ago, 25 furnaces were blown out or banked after having reached the year's high point of 117 in May.

Average daily production in June was 51,949 tons, which, compared with the 55,986 tons of May, was a loss of 4037 tons, or 7.2 per cent. The rate for June, 1934, was 64,563 tons.

Total production for the month was 1,558,463 tons, a decrease of 177,114 tons, or 10.2 per cent, from the 1,735,577-ton output of the preceding month. In June one year ago, output totaled 1,936,897 tons.

Relating production to capacity, June had an operating rate of 37.2 per cent, compared with 40.2 per cent in May, 34.2 per cent in January, and 46.3 per cent in June of last year.

The 91 operating blast furnaces on June 30 compared with 96 in May, 97 in April, 97 in March, 96 in February and 89 in January. In June of 1934 operating stacks totaled 92.

During June, 4 furnaces resumed and 9 were blown out or banked. Of the steelworks, or nonmerchant, classification, 3 resumed and 9 were blown out; of the merchant classification, 1 was blown in and none blown out.

Furnaces resuming in June were: In Ohio: Anna, Struthers Iron & Steel Co.; Mingo No. 4, Carnegie Steel Co. In Pennsylvania: National No. 4, National Tube Co. In Kentucky: Norton, American Rolling Mill Co.

Stacks blowing out or banking were: In Pennsylvania: National Nos. 1 and 4, National Tube Co.; one Aliquippa, Jones & Laughlin Steel Corp. In West Virginia: Riverside, Wheeling Steel Corp. In Alabama: Ensley Nos. 2, 5 and 6, Tennessee Coal, Iron & Railroad Co. In Indiana: Gary No. 9, Illinois Steel Co. In Illinois: South Works New No. 10, Illinois Steel Co.

With Carnegie Steel Co. announcing abandonment of its three blast furnaces at its New Castle, Pa.,

AVERAGE DAILY PRODUCTION

Gross Tons

	1935	1934	1933	1932
Jan.	47,692	39,537	18,348	31,336
Feb.	57,675	45,385	19,752	33,122
Mar.	57,120	52,438	17,484	31,194
Apr.	55,719	57,873	20,786	28,524
May	55,986	66,370	28,784	25,282
June	51,949	64,563	42,165	20,867
July	.....	39,630	58,108	18,394
Aug.	.....	34,199	59,137	17,035
Sept.	.....	29,969	50,264	19,788
Oct.	.....	30,689	43,824	20,795
Nov.	.....	31,930	36,124	20,858
Dec.	.....	33,161	38,456	17,650
Ave.	54,309	43,774	36,223	23,699

JUNE IRON PRODUCTION

	No. in blast last day of June	No. in blast last day of May	Total tonnage Merchant	Total tonnage Nonmerchant
Ohio	25	23	76,697	332,541
Penna.	26	28	31,704*	397,899*
Alabama	7	10	55,644	49,938*
Illinois	7	8	38,425	128,608
New York	7	7	42,750	56,936*
Colorado	1	1		
Indiana	6	7	3,311*	219,671
Maryland	3	3		
Virginia	1	1		
Kentucky	2	1		
Mass.	0	0		
Tennessee	0	0		
Utah	1	1	.....	121,336
West Va.	2	2		
Michigan	3	3		
Minnesota	0	0		
Missouri	0	0		
Total	91	96	248,534*	1,309,929*

*Includes ferro and spiegeleisen.

MONTHLY IRON PRODUCTION

Gross Tons

	1935	1934	1933
Jan.	1,478,443	1,225,643	568,785
Feb.	1,614,905	1,270,792	553,067
Mar.	1,770,990	1,625,588	542,013
Apr.	1,671,556	1,736,217	623,606
May	1,735,577	2,057,471	892,326
June	1,558,463	1,936,897	1,264,953
Tot. 6 mo.	9,829,934	9,852,608	4,444,750
July	.....	1,228,544	1,801,345
Aug.	.....	1,060,187	1,833,265
Sept.	.....	899,075	1,507,931
Oct.	.....	951,353	1,358,540
Nov.	.....	957,906	1,083,740
Dec.	.....	1,028,006	1,192,136
Total	.....	15,977,679	13,221,707

works, the number of potential units in the United States is reduced from 275 to 272. Four furnaces were erected when the plant was built, but No. 1 was dismantled in 1927. Nos. 2, 3 and 4, inactive for several years and now to be dismantled, had an annual capacity of 603,500 tons of pig iron.

(The 6-month total herein noted—9,829,934 tons—is the final figure, superseding the estimate necessitated by the time element in the drawing on page 14).

May Steel Imports And Exports Gain

AGAIN of 65.5 per cent in steel and iron imports in May over April brought the total to the highest point since September, 1933. Imports in May totaled 47,719 gross tons, compared with 28,866 gross tons in April, according to the metals and minerals division of the department of commerce.

The largest gain was in receipts of pig iron, which rose 14,927 tons, followed by cotton ties with an increase of 1474 tons, steel bars 1330 tons, structural shapes 1458 tons and wire rods 656 tons.

Total imports of pig iron, the largest item received, were 23,174 gross tons, of which 10,101 gross tons came from the United Kingdom, 7361 tons from the Netherlands, 2743 tons from British India, 2483 tons from Soviet Russia and 486 tons from Canada.

The United Kingdom was the largest supplier, with a total of 10,462 tons, nearly all pig iron; Belgium was second with 7929 tons of varied products; the Netherlands third with 7506 tons, practically all pig iron; Germany fourth with 6564 tons of varied products; and Canada fifth with 4758 tons, which included 3333 tons of spiegeleisen.

Sharp increases in exports in May lifted shipments of iron and steel scrap to 209,425 tons, tin plate scrap to 6583, tin plate to 7349, black sheets to 9363, galvanized sheets to 7445 tons.

Complete export statistics will be published in the July 15 issue.

ORIGIN OF MAY IMPORTS

Gross Tons

	Pig iron	Manganese ore	Ferromanganese
Netherlands	7,361	.....	116
Russia	2,483	8,873	.....
United Kingdom	10,101	.....	.....
Canada	486	75	3,333
British India	2,743	557	.....
Chile	.....	129	.....
Gold Coast	.....	2,573	.....
France	.....	.....	41
Norway	.....	.....	1,055
Italy	.....	.....	88
Total	23,174	12,207	4,633

	Sheets, skelp and sawplate	Structural steel	Steel bars	Hoops and bands
United Kingdom	5	.....	28	12
Belgium	501	2,332	1,997	1,566
France	53	1,033	350	489
Germany	44	321	24	1,640
Sweden	18	.....	312	4
Canada	1	.....	1	.....
Austria	.....	.....	14	.....
Czechoslovakia	.....	.....	1	.....
Poland	.....	.....	10	39
Total	622	3,686	2,737	3,750

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

	1935 Imports	1935 Exports	1934 Imports	1934 Exports
Jan.	22,784	262,740	22,653	178,023
Feb.	28,905	228,537	25,407	151,184
Mar.	21,409	323,035	38,393	261,269
April	28,866	205,336	26,862	201,539
May	47,719	286,598	29,465	241,753
5 mo.	149,683	1,306,246	142,757	1,033,768
June	.....	.....	24,848	219,406
July	.....	.....	17,676	233,186
Aug.	.....	.....	32,418	242,947
Sept.	.....	.....	23,847	301,330
Oct.	.....	.....	20,202	220,209
Nov.	.....	.....	35,272	299,263
Dec.	.....	.....	19,708	282,655
Total	.....	.....	316,761	2,832,764

UNITED STATES IMPORTS OF IRON AND STEEL PRODUCTS

(Gross Tons)

Articles	May, 1935	April, 1935	Jan. thru May, 1935
Pig iron	23,174	8,247	46,903
Sponge iron	50	104	462
Ferromanganese, spiegeleisen (1)	4,633	5,563	18,375
Ferrochrome (2)	.....	.....	1
Ferrosilicon (3)	25	80	466
Other ferroalloys (4)	.....	.....	1
Scrap	823	1,259	9,639
Steel ingots, blooms, etc.	34	348	1,004
Concrete bars	190	117	508
Hollow bar, drill steel	92	158	405
Merchant steel bars	843	1,407	7,506
Bars, solid, hollow (6)	1,894	.....	1,894
Iron slabs	.....	.....	.....
Iron bars	48	53	317
Wire rods	1,750	1,094	6,452
Boiler and other plate	.....	37	73
Sheets, skelp, saw plate	622	785	2,696
Tin plate	17	37	100
Structural shapes	3,686	2,228	13,087
Sheet piling	.....	.....	.....
Rails and fastenings	379	459	1,459
Cast iron pipe, fittings	.....	.....	.....
Malleable iron pipe fittings, advanced (5)	.....	.....	46
Welded pipe	175	83	554
Other pipe	1,337	396	4,942
Cotton ties (5)	1,474	.....	1,743
Other hoops and bands	2,276	1,491	8,557
Barbed wire	1,900	1,813	10,978
Round iron, steel wire	388	339	1,696
Telegraph, telephone wire	6	3	13
Flat wire, strip steel	134	205	706
Wire rope and strand	98	189	797
Other wire	57	57	397
Nails, tacks, staples	1,441	2,211	6,950
Bolts, nuts, rivets	37	19	142
Horse and mule shoes	61	37	318
Castings and forgings	75	47	496
Total, gross tons	47,719	28,866	149,683

(1) Manganese content.
(2) Chrome content.
(3) Silicon content.
(4) Alloy content.
(5) New class—no comparable figures for 1934 and previous years.
(6) New classification as result of reciprocal trade agreement with Belgium. No comparable figures for previous month or year.

Production

STEELMAKING receded sharply last week to 31 per cent, off 6 points, owing to general shutdowns in all districts, except Birmingham, over the holiday. It is expected the rate will rebound to at least 35 per cent this week. In the comparable period last year production dropped from 46 to 22 per cent and rebounded to 30 per cent. Details follow:

Central Eastern Seaboard—Down 8 points to 21 per cent, due to holiday influences. There is some doubt expressed as to whether production will recover fully this week to the 29 per cent rate of the week previous. As expected, finishing operations last week declined more sharply than ingot output.

Pittsburgh—Off 10 points through last week to 20 per cent because of widespread observance from July 3-7, inclusive, of the week's holiday. Most plants closed open-hearth departments for this period, although some were shut down from June 29 to July 7. With this week, however, operations will advance approximately 12 points to 32 per cent, with resumption on a more nearly normal basis of finishing mill schedules.

Nineteen out of 60 steelworks blast furnaces were on active schedule last week, a loss of one from the week preceding due to Jones & Laughlin Steel Corp. blowing out an Aliquippa, Pa., furnace. National Tube Co. has not yet resumed blast in a Monongahela blast furnace which went on bank June 29.

New England—Down five points to 56 per cent last week, with indications of a point or two loss starting this week.

Detroit—Off 16 points to 78 per cent last week, owing to recessions over the July 4 holiday.

Youngstown—Averaged 26 per cent last week, off 16 points, due to

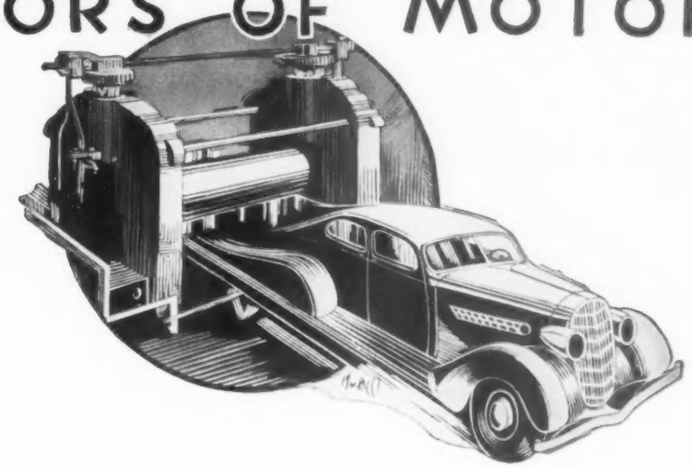
(*Please turn to Page* 82)

Steelmaking Operations

Percentage of Open Hearth Ingot Capacity Engaged in 10 Leading Districts

	Week ended July 6	Change	Same week 1934	Same week 1933
Pittsburgh	20	—10	15	46
Chicago	33	— 8	28	56
Eastern Pa.	21	— 8	18½	40
Youngstown	26	—16	15	63
Wheeling	40	— 8	24	90
Cleveland	16	—30	26	87
Buffalo	29	— 3	0	54
Birmingham	30	None	17½	75
New England	56	— 5	55	83
Detroit	78	—16	46	38
Average	31	— 6	22	55

MIRRORS OF MOTORDOM



DETROIT

EVEN the stalwarts who have been predicting a good summer and fall for the automobile industry appear to have understated the case.

To thwart completely seasonal influences which bear down on production in July seems as impossible as the task to which Canute once applied himself. Unmistakably, too, the industry is pointing toward new models and is either working off or holding down inventories for current series.

But—retail sales are hanging on remarkably well after the brisk spring and early summer; the threatened menace of a used car surfeit has not fully materialized; the reaction coming in from the country is that the President's defeat in congress as well as the Supreme Court is a further earnest of recovery and supports the conviction that business will improve despite Washington.

Assemblies Unslackened

Passing over last week as abnormal on account of the holiday, consider some typical assembly schedules for early July, when sharp declines are the rule: Chevrolet is practically at its spring peak of 28,500 weekly; Packard is expanding its daily production of the small job to 300; Terraplane-Hudson is increasing a little, to about 1800 weekly; Olds is holding at about 4400 and Pontiac at 4000.

One result is slightly heavier releases for steel and other materials for further runs on 1935 models; these buys are not individually large but they represent business not expected. Another outcome is a deferment of plans for putting 1936 jobs on the line early in the autumn.

Typical is the situation of one moderate-size interest which is well along with a large tool and die program and planned to introduce its new models about Sept. 1. This interest is experiencing such good demand for its present cars that Nov. 1 is now discussed for the debut.

Nash and Lafayette may not only be first to show 1936 cars but they may turn out to be far ahead of the procession.

Vendors also are experiencing a fillip from the program of some parts and body makers in building up banks against the time to be taken out for the changeover to new stuff. Briggs, for example, has a stiff schedule for July in anticipation of being down August and possibly part of September in some departments for retooling and other changes incident to 1936 business.

Meanwhile, the suppliers benefit in varying degree from extension of schedules on 1935 models, and are beginning to receive releases for materialh for mechanical parts for new models not subject to last-minute changes on account of styling. This business, of course, will not attain volume until 30 to 45 days ahead of the actual changeover.

Typical is the contract Midland, at Cleveland, has booked from Chrysler for frames, and Budd, at Philadelphia, on Chevrolet frames. The initial Budd order for flat-rolled steel is 35,000 tons; the Midland contract, using steel from Otis, is publicly valued at $6,000,000, but will amount to considerably more before the season is over.

May Delay Releases

Suppliers, including steelmakers, have been counting upon Aug. 10 as the period when substantial releases for new models will be issued, but this date is subject to deferment in case the late July retail market is as active as the early July one.

Several important automotive consumers of steel have distributed third quarter business on the usual basis of percentage of actual requirement. It is not known that any steel prices have been shaded, but consumers continue to talk of their volume meriting differentials for quantity, and in this attitude they have the support of warehouses and converters of semifinished materials.

Were it not for furtive whispering concerning new models, the season in Detroit might be mistaken for March or April, so virile is the automotive situation. There is only one cloud in the sky, and that is only faintly discernible at this time but is regarded apprehensively by those on the inside. That is labor.

Seeing the American Federation of Labor and other organizations tapping a juicy source for dues, leaders in some employe plans are attempting to become business men and keep this money in Detroit. They have set up an independent union, and at one plant slightly over half of the employes are said to have been persuaded to join, with a corresponding dilution of the employe plan.

Fomenters Still at Work

Father Coughlin's offer to help organize automotive labor and get a minimum annual wage of $2150 has not helped matters any. No demands have yet been made, but the start on new models might be a propitious time. Chrysler now appears to be the danger point.

A voluntary increase in wages, which may be the fuse for a similar detonation in other industries, might anticipate demands this fall and steal the thunder from this new leadership of labor.

Coincident with this invasion of employe plan membership is an intensified movement to organize drafting room employes. This is a refinement of the tool and die maker organization movement.

Ford production has eased off rapidly over the past few weeks, to such an extent exciting some gossip in Detroit, but the answer probably is the early start made late last year on 1935 models. Layoffs at the Rouge plant have been heavy recently, and actual production is believed to be considerably under the 20,000 weekly rate recently credited to Ford.

Subject to change according to market conditions, Ford is expected

to go down the night of July 26 for a two-week vacation, resuming on Aug. 12, this date also depending upon the retail situation.

A story current in Detroit is that Ford is maturing certain engine refinements leading up to a campaign for debunking frequent oil changes. The economy of an oil-change cycle of about 10,000 miles may be stressed.

At present oil filters are extra equipment on Fords, but the 1935 models feature a crankcase ventilation system hooked up with the fan.

As a matter of fact, many automobile engineers attached to Detroit companies do not change oftener than every spring and every fall, and so do some large fleet owners.

Oil companies may well regard any move by Ford apprehensively. If 1,000,000 Ford owners changed oil every 9000 miles instead of every 1500 miles that would obviate five oil changes in the meantime.

With the Ford crankshaft capacity five quarts, this would mean the destruction of a market for 25,000,000 quarts, or $7,500,000 worth at the present 30-cent market. The saving in the federal tax alone to this million Ford owners would be $250,000.

Changes in Steering Pending

Ford is experimenting with steering improvements designed by both Ross and Gemmer. Hudson is another manufacturer considering steering refinements for 1936. Hudson-Terraplane sales in the week ended June 29, totaling 2403, were the second largest for 1935.

Operations at Murray Body, incidentally, have tapered off rapidly as a result of the contraction by Ford.

When Packard put its low-price car in production it set up a new assembly line having a daily capacity of 250. This has been speeded up to as high as 294 in one day. It now is rushing through an auxiliary line having a daily capacity of 50 cars and is aiming at a daily rate of 300 by early August. Beginning shortly, Packard will hang the front doors on the small job at the front instead of the center.

The rush at Fisher Body, resulting in an unusually large amount of die and Keller work being let outside, is due chiefly to the program on the standard Chevrolet.

Ford advertising has frequently emphasized the fact that, whether a regular or a deluxe job, all Fords are identical in chassis, engine and other "key" mechanical parts. This has been a pot shot at Chevrolet, whose standard line has not been synonymous with the master series in many of these respects. In lesser degree this Ford shaft hit Plymouth.

Beginning with the 1936 line, the low-price Chevrolet, which is most nearly competitive with the standard Ford in price, will carry refinements that will obviate this comparison. In fact, the standard Chevrolet almost becomes the master one. This suggests, of course, a new setup for the master Chevrolet.

It now appears that Pontiac and Olds may beat out Buick in presenting 1936 cars. Both Pontiac and Olds will retain front fender, body and running board lines substantially intact, but there will be changes in radiator grilles and rear fenders.

Last week President McCuen of Oldsmobile drove from the assembly line Oldsmobile No. 102,029, which broke the 1929 record, when 102,028 Oldsmobiles were built. An output of 150,000 Olds this year is forecast. With seven months to go, Olds already has sold more cars at retail than in all 1934.

New Series Postponed

Buick, originally expected to be out late in August, apparently will not make any announcement before September. Its radiator grille, to be die cast, apparently will be a blending of the present Buick and something resembling the Oldsmobile grille.

Buick, of course, will have hydraulic brakes, turret top and much more pronounced streamlining. A report that one series will be extremely tear-dropped is denied.

Chrysler is sensitive about it, but the report will not down that it is making propress with a radical new transmission.

Ford may go to a helical gear transmission for 1936, while General Motors has adopted on buses a transmission that eliminates clutch and gear shift and utilizes centrifugal force.

However, probably the most radical innovation by the Chrysler Corp. for 1936 will be the redesign of Plymouth. Chrysler also has a big truck program under way; few persons realize what a large seller of trucks it is.

Hupp appears to have survived another stockholder's suit and is about to launch a large newspaper campaign. Hupp production has been about 425 units a week.

Cadillac-LaSalle will be down two weeks this month on vacation, older workers receiving pay.

A steel producer owning a patented process for machine forging and whose products are used for camshafts, crankshafts and the A-arm for coil spring supports, is warning several other steel manufacturers against alleged infringement, and some conferences are being scheduled. No action, it is understood, is contemplated against automotive consumers buying from the companies put on notice.

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1933	1934	1935
Jan.	128,825	155,666	292,817
Feb.	105,447	230,256	335,699
Mar.	115,272	338,434	429,834
Apr.	176,432	352,975	477,746
May	214,411	330,455	364,721
June	249,727	306,477	*340,000
6 Mo.	990,114	1,714,263	*2,240,817
July	229,357	264,933	.....
Aug.	232,855	234,811	.....
Sept.	191,800	170,007	.....
Oct.	134,683	131,991	.....
Nov.	60,683	83,482	.....
Dec.	80,565	153,624	.....
Year	1,920,057	2,753,111	.....

*Estimated.

Estimated by *Cram's Reports*

Week ended:

June 8	87,755
June 15	90,788
June 22	90,586
June 29	89,037
July 6	59,380

Institute

MEETING of directors of the American Iron and Steel institute in New York, July 11, is expected to provide the first insight into views of the steel industry on trade practice, wage and hour issues, since the general meeting of June 6 when the industry pledged maintenance of code standards.

Attorneys for the Institute, it is understood, have explored every avenue bearing upon these issues, and are believed to have concluded that Washington is in no mood to accept any voluntary open-price plan.

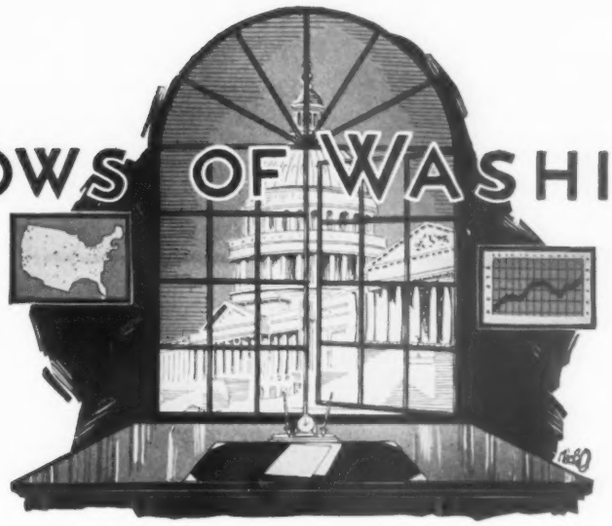
This is especially true since the federal trade commission has swallowed up NRA (see p. 23), because the commission is known to have ideas hostile to the present basing point system and to regard it as a vehicle for price stabilization.

Since the expiration of the steel code one maker has filed prices with the Institute, but this is said to be the exception and not to set a precedent.

Steel in the News

HIBBING, Minn., dubbed the "richest city" and noteworthy for public expenditures made possible by large tax revenues from underlying iron ore properties, is constructing a schoolhouse of translucent glass blocks, costing $33,000.

WINDOWS OF WASHINGTON



WASHINGTON

AFTER two years of struggle the federal trade commission has gobbled up NRA. As expressed by the President, NRA will do a lot of "spade" work in connection with any proposed agreements—but the real work will be done at and by the commission. In other words, NRA codes are "out" and the organization will be used only for assistance by the trade commission.

After a conference at the White House last week between the President, members of the commission, James L. O'Neill, acting administrator of NRA, and Attorney General Cummings, it was announced that the commission would resume holding trade practice conferences as was done prior to the establishment of NRA two years ago.

Judge Ewin Davis, who is chairman of the trade commission, stated that between 50 and 100 inquiries preliminary to the holding of such conferences have been received by the commission. He said if it appears to the commission that there is an urgent demand within an industry for a conference, the commission will hold the conference. He further stated that if labor and wage provisions are desired they may be included in the voluntary or group two parts of such trade agreements.

New Act Unconstitutional?

There is some interesting talk here to the effect that the attorney general engineered things around to the point where the commission got NRA and not *vice versa* because he is reported not to be so sure even now of the constitutionality of the new NRA act. In fact, this is not the first time that the attorney general has given the administration some wrong advice along this line.

It is reported that NRA will deal with hours, wages and child labor, but officials of NRA don't have any very rosy picture of any industry coming along asking for such provisions in a code when it doesn't have to. This appeared as rather a joke even to the acting administrator when he was asked about it. And so it seems the President was right: NRA will do the "spade" work — whatever he meant by that.

The President himself has asked the trade commission to begin negotiations for voluntary trade practice agreements, and therefore this question of principle which has been pending for several weeks has at last been solved. These agreements, of course, supplant old NRA codes.

This new arrangement virtually deprives NRA of all code-making authority and will mean its continuance only as a research and fact-finding organization.

Trade Rules Not Killed

The action of the President in turning trade agreements over to the trade commission returns government regulation to the position existing before the enactment of the recovery act. Of course, the commission agreements have been in existence for several years but during the past couple years they have been completely overshadowed by the NRA codes. However, no trade practice rules that have ever been promulgated have been abrogated.

This announcement by the President came just as William Green, president of A. F. of L., held a conference with the President on the proposed permanent legislation for NRA which the federation hopes may be enacted into law. However, in spite of the attitude of labor it is not believed that any such legislation can possibly be passed at the present session of congress.

The bill, which Mr. Green discussed with the President and which has been drawn up by the federation, would prohibit the shipment in interstate commerce of any articles produced in violation of terms of the bill. It provides that no one under 16 years of age shall be eligible for employment.

The proposed act would be administered by a commission of five members, representing employers and employes. The commission would be empowered to license businesses in interstate and foreign commerce. It would have the power to revoke licenses and to appoint trustees to operate businesses the licenses of which had been revoked. The bill requires employers to bargain collectively with employes and it prohibits unfair trade practices.

The bill has not yet been introduced in either house of congress, but it probably will be in a short time.

Acting NRA Administrator O'Neill at a press conference last week stated that no one in his organization is writing any proposed new NRA legislation. He expressed the belief that the federal trade commission would probably modernize its trade practice conferences. On the other hand, inquiry at the commission as to the commodities in which requests had been made for trade practices met the statement that no information on this subject is ready to be given out now.

FTC Proceeding Slowly

The commission feels that it cannot go ahead with trade practice conferences unless the "majority" of any given industry wants such rules. It was indicated that a preliminary survey of this kind might take several months. All of which goes to show that the commission is not going to change—very much.

Mr. O'Neill stated that in the future all applications are to go to the trade commission and any applications received by NRA will be sent to it. The only thing left for NRA to do, he indicated, was to supply the commission any information it could on labor matters. He said that the Blue Eagle for the present is in "cold storage."

It was said by Mr. O'Neill that the trade commission will consider the matter of price-filing in connection with trade practice rules. Insofar as

is known, this has never been done before.

It is time that something definite is done at NRA because the personnel has been very much demoralized. About 8 per cent of the employes have been placed elsewhere, and Mr. O'Neill expects to finish the job of letting employes go within the next few months.

There are a good many persons here who believe that the present membership of the trade commission is much more liberal minded than former members of the commission and that business might get some kind of a reasonable deal. On the other hand, this is hard for business to believe in view of past experiences.

PRESIDENT TAKES OPTION ON STEEL BOARD PERSONNEL

Apparently in an effort to keep the personnel together until he can take some action under the Wagner labor disputes law, the President has extended "until further order" the national steel labor relations board.

This does not mean that the board can sit as a quasi-judicial body, as it did once. Shortly after the resolution was passed continuing NRA until next April, the President continued the steel board until July 1. This latest action, then, is merely a further continuance of that original executive order.

It is generally believed here that the new executive order is simply a stop-gap until detailed action can be taken in setting up the new board as provided for in the Wagner bill. At the same time, the President continued the life of the national labor relations board until "Aug. 1, 1935" and the life of the textile labor relations board "until further order."

WOOD IS FIFTH BUSINESS MAN TO QUIT NEW DEAL RECENTLY

Gen. R. E. Wood, chairman of the board of Sears. Roebuck & Co., Chicago, has resigned as a member of the federal allotment board of the public works administration. There was no ballyhoo about General Wood's resignation, but there was much of it from the White House when announcement was made that he would represent industry on that board.

It has been explained by the White House secretariat that General Wood accepted appointment on the allotment board as a representative of business on the condition that he could resign on July 1. As a matter of fact, when his appoinment was officially announced at the White House—nothing like that was mentioned.

There is talk here that General Wood has expressed dissatisfaction with the turn which the works program has taken. He is said to believe that the works relief fund should be used for major public works projects. Under the plan as it is now shaping up under Mr. Hopkins' control, there will be little work for the allotment board.

The outcome of the work relief program has been unsatisfactory so far to the durable goods industry, which will benefit little from the scheme as it is now being worked out—and in addition it has left any number of people unhappy who accepted service under the program visualizing more important activities—and this is believed to be the case with General Wood.

General Wood is the fifth big business man to leave new deal counsels lately. The others are Edward L. Ryerson Jr., of Joseph T. Ryerson & Son Inc., Chicago; Harold C. Smith, of the Illinois Tool Co., Chicago; Howard Heinz, of Pittsburgh; and Robert E. Lund, St. Louis, of the National Association of Manufacturers.

PWA LISTS ITS BENEFITS TO STEEL, CAST PIPE PLANTS

A 65 per cent increase of employment in March over March, 1933, in 12 heavy industries which received orders for $553,000,000 worth of materials for PWA projects, is reported by the bureau of labor statistics.

The report states that manufacturers of steelworks and rolling mill products, which received orders for PWA materials totaling $146,717,000, increased their payrolls from 207,000 in March, 1933 to 328,000 in March, this year.

Indirect employment in the steel industry has been created by orders for 750,000 tons of railroad rails, structural shapes for bridges, such as the Triboro bridge in New York, and similar projects.

The increase of 121,000 men reported in March over March, 1933, by the bureau occurred in steel fabricating and manufacturing plants only, and does not include the large number of men put back on payrolls to get out iron ore, coal and other basic materials used in iron and steel production.

Employment in the cast iron pipe industry rose 87 per cent from 5800 in March, 1933, to 11,000 last March. PWA water and sewer projects supplied the industry with $15,627,000 worth of orders. In 1933 the entire output of the industry was valued at $21,000,000.

FIND NAVY TOOLS OBSOLETE

Informal reports have reached here in connection with the inspection being made by naval officers of the machine tools of the various navy yards of the country which was begun a couple of weeks ago.

Up to this time the committee has visited some of the larger navy yards of the east coast and the reports indicate that much obsolete machinery is now in use. It will probably be sometime before any formal report is made to the secretary of the navy on the inspection trip.

TAX HEARINGS START THIS WEEK; SENATORS LUKEWARM

The house ways and means committee is ready to start hearings on the proposed new tax bill this week. No one knows, or will even guess, how long these hearings will last.

As a matter of fact, a secret poll was taken of the 25 members of the committee—both Democrats and Republicans—which is said to have shown that 15 of them are opposed to any new tax legislation at this session. However, administration leaders are driving them on.

There is also a concerted movement in the senate to postpone this legislation until a special session can be called in the autumn. At the time this is written, such action does not seem to be contemplated by administration leaders.

Senator Harrison, chairman of the senate finance committee, has stated that while the house is considering the tax bill—after it is reported out of committee—his committee will rush through hearings so that the senate can be ready to take immediate action when the bill reaches that body, to delay it as little as possible.

EXPECT GUFFEY BILL OK AS MINERS STILL TALK STRIKE

The Guffey coal bill is expected to be favorably reported out of the house ways and means committee any time now. Labor is pressing for the immediate passage of this bill, holding the strike as a threat.

It will be recalled that the bill is on the "must" list of legislation favored by the President. Opponents plan to challenge its constitutionality quickly if it is passed.

Hugh R. Hawthorne, of New York, vice president of the Pocahontas Fuel Co. and chairman of the committee against the bill, in a formal statement declared that "the defeat of the Guffey-Snyder coal bill will quickly end the threat of a nation wide coal strike."

CALLS RATE HEARING AUG. 6

Interstate commerce commission has set for hearing on Aug. 6 the application of certain roads asking for authority to establish and maintain rates on iron and steel articles, also tin and terne plate, in carloads, from points in trunk line, central freight association and Buffalo-Pittsburgh territoriese to Charleston, S. C., and Savannah, Ga., and Jacksonville, Fla., over rail and water routes through the ports of New York, Philadelphia and Baltimore. The hearing will be before Examiner C. K. Glover of the commission.

Industrial Men in the Day's News

O. E. Romig, Manager, Electrical Sheet Division, American Sheet & Tin Plate Co.

Graduate of two colleges on the West Coast, for two years he was Austin teaching fellow at Harvard.

Turning his efforts to the steel industry in 1925, he devoted several years to research metallurgy.

A metallurgist for the last five years at Gary, Ind., he now returns to offices at Pittsburgh.

O. E. ROMIG, who recently (STEEL, June 24) assumed his new appointment as manager of the electrical sheet division of American Sheet & Tin Plate Co., Pittsburgh, has spent his business career at Gary, Ind., and Pittsburgh.

He was first associated with the research laboratory of Sheet & Tin Plate in Pittsburgh, and also the Vandergrift, Pa., works of the company. This affiliation dated over a 5-year period, beginning in 1925 and ending in 1930. For the past five years he has been metallurgist at the company's Gary, Ind., sheet mill, and in his new position with headquarters in the Frick building, Pittsburgh, once agan returns to that city.

He is a graduate of Pacific university, Forest Grove, Oreg., in 1920, and Oregon State college, Corvallis, Oreg., in 1922. He received his master's degree from Harvard university, Cambridge, Mass., in 1924, and for two years was Austin teaching fellow there.

He has been a member of the American Society for Metals for the past 10 years.

• • •

Albert Reichmann, former assistant chief engineer of the American Bridge Co., Pittsburgh, has been elected vice president, with offices at Chicago.

Charles F. Goodrich, also former assistant chief engineer for American Bridge, at New York, has been appointed chief engineer, with offices in the Frick building, Pittsburgh, succeeding Richard Khuen Jr., resigned. Mr. Khuen has been identified with the company over the past 41 years as resident engineer of the Pittsburgh division, general manager of erection, and since 1931 chief engineer.

Chauncey E. Webb has been appointed division engineer in charge of the western division of American Bridge, with offices at Chicago.

• • •

P. S. McCutcheon and W. H. Blount have been appointed to the active management of properties of Sleeper & Hartley Inc., Worcester, Mass., manufacturer of spring, cable armoring, flexible casing and tube, and wire mill machinery.

C. S. Arms continues as consulting engineer on wire mill equipment.

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Fred E. Wilhelm has been appointed sales representative for Maydwell & Hartzell Inc., San Francisco and Los Angeles, Pacific Coast manager for Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y. His previous affiliations include Judson Mfg. Co., Judson-Pacific Co., Pacific Coast Steel Co. and Pacific Coast Steel Corp. of San Francisco.

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P. J. Potter, formerly second vice president of the Pangborn Corp., Hagerstown, Md., has been elected a director and vice president and will be directly responsible for engineering, sales and production. He has been associated with the company for 20 years. In 1922 he was named works manager of the foundry and manufacturing plant, and in 1931 was elected a second vice president and with his co-worker, Victor F. Stine, was promoted to sales director. Mr. Stine, associated with Pangborn since 1912, recently was elected a second vice president and now has been made sales manager. At various times he has been in charge of the order, accounting, purchasing and sales departments.

• • •

W. S. Long, formerly manager of mechanical sales in the Seattle district for the mechanical goods division of United States Rubber Products Inc., New York, has been transferred to the Los Angeles district as manager of mechanical sales there.

C. W. Gilmer, formerly salesman in the San Francisco district, succeeds Mr. Long as manager of mechanical sales in the Seattle district.

• • •

David Hill, foundry and power transmission machinery engineer, has been named service and development engineer for Beardsley & Piper Co., Chicago, foundry equipment manufacturer. He has been active in this field for over 20 years, past associations including the Ford Motor Co., Palmer-Bee Co., and American Radiator Co.

David Hill

• • •

Franklyn W. Wagner has been appointed vice president and general manager of the Hazlett Chute & Conveyor Co., Oaks, Pa., to succeed C. H. Chubbuck, who has resigned because of ill health. Mr. Wagner has served

in the capacities of chief draftsman, Philadelphia and New York sales manager, and chief engineer of the company. Both he and Mr. Chubbuck have been associated with the company since its incorporation in 1923. The company specializes in spiral chutes and conveying machinery.

♦ ♦ ♦

George A. Sohn has been elected secretary and James B. Kane, treasurer, of Booth & Flinn Co., Pittsburgh.. They succeed the late W. J. Wiseman, who was both secretary and treasurer.

♦ ♦ ♦

Eugene Costner, for the past five years superintendent of the Lewisburg mines, Sloss-Sheffield Steel & Iron Co., has been made divisional superintendent of mines for the company, with headquarters in Birmingham, Ala.

♦ ♦ ♦

W. J. Maton, Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., has been re-elected president of the Connecticut Foundrymen's association. Other officers are: B. W. Spencer, Connecticut Foundry Co., Rocky Hill, Conn., vice president; G. R. Holmes, McLagon Foundry Co., New Haven, treasurer; N. J. Stringer, Charles Parker Co., Meriden, secretary.

♦ ♦ ♦

John G. Barry, senior vice president of the General Electric Co., Schenectady, N. Y., has retired after over 45 years of service, having recently been elected honorary vice president. As active head of the company's apparatus sales organization he has formulated policies and sales programs in this field for many years. He joined the company's railway department in 1890 and in 1897 became assistant manager of the department—then one of the two main divisions of the company. He was named manager in 1907, and in 1917 the duties of general sales manager for the company were added to those specifically in the transportation field. He was made a vice president in 1922, and with J. R. Lovejoy was placed in charge of the company's apparatus sales.

A number of changes in the executive personnel of the apparatus engineering and sales organization of General Electric have been announced:

Commercial engineering activities of the transportation department and general office commercial transportation activities will report to Vice President H. L. Andrews, who will become a member of the apparatus sales committee.

Industrial commercial engineering will hereafter report to W. W. Miller, manager of the industrial department, and central station commercial engineering to M. O. Troy, manager of the central station department of the company.

Vice President E. W. Allen will be a member of the apparatus sales committee, will have supervision of the contract service department and in addition will assist the district offices.

Vice President E. O. Shreve will continue as executive representative of the company in the National Electrical Manufacturers association, and is appointed chairman of the apparatus sales committee, which will direct the general commercial policies of the apparatus departments of the company.

♦ ♦ ♦

Alexander Taylor, assistant to the vice president of Westinghouse Electric Mfg. Co., East Pittsburgh, Pa., has retired after 47 years' service. His retirement on June 30, which occurred on the same day that the last of the twin motor units on order at Westinghouse for Pennsylvania railroad was completed, witnessed the final testing and shipment of the motors' 204th unit. Mr. Taylor had been in charge of the production of the electicification contract. His first executive position was as superintendent of the company's Allegheny foundry, following which he was made works manager at East Pittsburgh in 1905, a post which he occupied for 15 years. In 1920, he was appointed assistant to the vice president.

W. W. Spangler has been appointed credit manager for Westinghouse. He started with the company in its Seattle office, and has held various positions, including assistant manager, department of syndication operations; supervisor commercial research, and a member of the executive staff of the vice president in charge of sales at New York. Before his present appointment he was treasury manager, northwestern district, Chicago.

T. J. Newcomb has been appointed manager of commercial refrigeration sales for Westinghouse, with offices at Mansfield, O. Recently he has been eastern manager of refrigeration sales at New York.

Dismantling

CARNEGIE STEEL CO. has announced the abandonment of its New Castle, Pa., steelworks, inactive since June 15, 1931.

During the past few weeks considerable equipment at the works has been salvaged and moved to other Carnegie divisions, as well as to divisions of other United States Steel Corp. subsidiaries. As soon as all reclaimable equipment is salvaged, the property will be open for dismantling bids.

The New Castle steelworks was built in 1892 and consists of two 12-ton bessemer converters, three cupolas, one 1000-ton mixer, and one 1100-ton mixer. In addition, the works has a 36-inch, two-high reversing blooming mill and two continuous sheet bar mills.

When the New Castle works was constructed there were four blast furnaces, but one was dismantled in 1927.

Recently (STEEL, July 1, p. 17), another Steel corporation subsidiary was sold for its scrap value, this being the Wellsville, O., works of American Sheet & Tin Plate Co., and not six months ago National Tube Co. sold its old National works in Pittsburgh, also for dismantling.

MINES CLOSE, AFTER 91 YEARS

Shook & Fletcher, of Birmingham, Ala., who for the past six years have operated the Shelby Iron Works ore mines at Shelby, Ala., are dismantling the machinery and will move to another location. The mines at Shelby are said to have been operated continuously since 1844.

Died:

CHARLES F. SWIGERT, 72, president of Pacific Bridge Co., Portland, Oreg., in San Francisco, June 23. He had been in business in Portland 54 years, 51 years of which he was with Pacific Bridge, which is now one unit of Six Companies Inc., builder of Boulder dam. Pacific Bridge also had contracts for the foundations of the Golden Gate bridge and the piers for the San Francisco-Oakland span.

♦ ♦ ♦

William A. Mattice, 53, an official of the Columbian Iron Works, Chattanooga, Tenn., July 2.

♦ ♦ ♦

Frank C. Ryan, 39, treasurer of the Kingston Products Co., Kokomo, Ind., automobile accessories and other metal products, in Kokomo, June 15.

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Charles B. Young, 70, former chief mechanical engineer of the Chicago, Burlington & Quincy railroad, in Riverside, Ill., July 1. He retired five years ago.

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Herbert E. Storrs, until three years ago purchasing agent for the Lodge & Shipley Machine Tool Co., Cincinnati, in that city, June 27. After retiring from Lodge & Shipley after 23 years, he became sales agent for machine tool interests.

♦ ♦ ♦

Edward P. Holler, 52, for 14 years connected with the Cleveland Ore and Coal Exchange, Cleveland, in that city, June 29. He was supervisor of all coal docks from Toledo, O., to Erie, Pa., and had charge of the loading of about 40,000,000 tons of coal a year into lake vessels.

EDITORIAL

'Haste Makes Waste' Applies To Voluntary Agreements

IF THE biting of a dog by a man is news, then certainly the act of a high NRA official in warning industry against the danger of ill-considered haste in applying for voluntary agreements to replace old codes is deserving of headline attention.

After two years of high-pressure exhortations by Washington to do this or that immediately and without questioning its advisability, it is both novel and refreshing to find a government spokesman who counsels restraint and deliberate action. Indeed, there may be some who wish this wise policy had been in effect at the White House recently when the "soak the rich" and "spread the wealth" tax program was bundled up to Capitol Hill with the inference it should be adopted in five days.

The author of this unusual statement is Prentiss L. Coonley, director of the division of business co-operation. In an order issued several days ago to NRA officials, he asked them to refrain from "actively encouraging" industries to submit formal applications for voluntary agreements.

"NRA must avoid premature action," he said, "which will necessitate retracing steps to conform to a subsequent revised policy. If a structure of voluntary agreements is to be built up, it must be built solidly and without undue burden of time, energy and cost upon industry. Therefore, NRA must have its own program clearly developed before it can encourage industry to proceed along any definite lines. . . . We repeat that the possibility of developing a program of voluntary co-operation must not be handicapped and perhaps destroyed by action so rapid and unconsidered as to lead to continual and confusing revision."

Advice Will Save Errors Detrimental to Old NRA; Business Sees Value of Waiting

Mr. Coonley puts his finger on the principal defects of the administration of the old NRA codes. Unlike many of his predecessors, he realizes the unfairness of imposing an "undue burden of time, energy and cost" upon industry. Even more important, he appreciates the disastrous consequences of "continual and confusing revision." If the NRA administrators in 1933 and 1934 had acted according to the advice now given by the head of the division of business co-operation, it is quite possible that NRA would have given a better account of itself.

That clear-headed industrial executives will recognize the merit of Director Coonley's suggestion goes without saying. Already the Machinery and Allied Products institute, representing many industrial groups in the durable goods field, has counseled its member companies and associations to move cautiously in regard to voluntary codes. At its recent meeting in Cleveland, the institute through its executive committee recomended that "under the uncertain conditions prevailing as to pending and prospective national legislation, and until such legislative situation becomes clarified, no action be taken . . . toward entering into voluntary codes or agreements under the national industrial recovery act or the federal trade comission."

This advice, which corresponds so closely to that offered by Director Coonley, should be heeded by every unit in industry. Industrial groups will do well to keep out of entangling alliances with government agencies until the opportunities and obligations on both sides are clearly and definitely known.

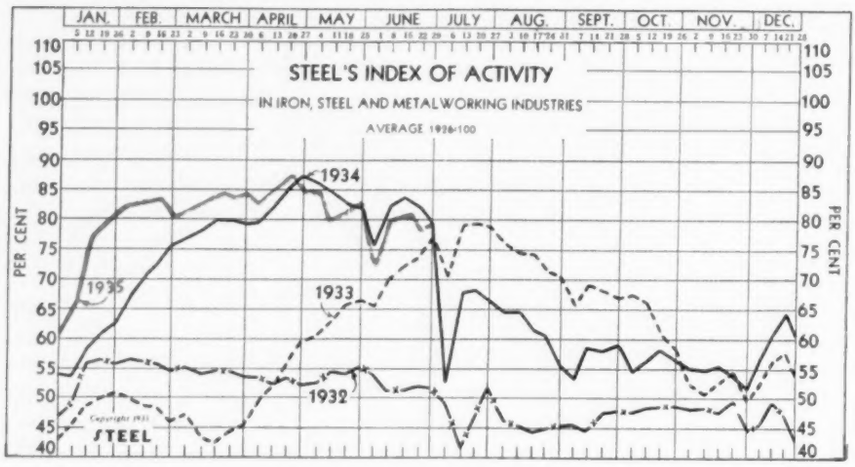
Caution Needed To Avoid Pitfalls Caused By Sudden Political Changes of Viewpoint

Only through such caution can industry avoid being drawn into new situations charged with invisible dangers. The record of the new deal administration to date has been characterized by many unsavory situations whereby agreements, entered into innocently and sincerely by government and industry alike, have been so altered by political expediency that industry has found itself committed to obligations which were not originally contemplated. The trouble with agreements with the government is that government agencies cannot be held responsible for anything, nor can the head of a government bureau guarantee his promises. His promise today may be broken with impunity by his successor tomorrow On the other hand, industry's representatives can he held strictly accountable for their acts.

The resignation the past ten days of a half dozen representatives of business on the advisory and planning council of the department of commerce and the allotment board of the public works program should be a danger signal to industry.

Industry will do well to sit tight until all the cards are on the table, face up. Also, it might make sure that there are 52 cards, and no more, in each deck.

THE BUSINESS TREND



STEEL'S *index of activity in the iron, steel and metalworking industries gained 0.8 points to 78.1 in the week ending June 29:*

Week ending	1935	1934	1933	1932
May 4	84.6	86.0	60.3	54.7
May 11	79.3	84.4	62.5	54.3
May 18	80.5	82.4	65.2	55.1
May 25	82.8	81.9	66.1	54.2
June 1	71.9	75.7	65.3	51.0
June 8	79.3	82.3	69.9	51.1
June 15	80.0	83.6	72.1	51.8
June 22	77.3†	81.8	73.	51.6
June 29	78.1*	79.4	77.0	49.2

†Revised. *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL*). Average for 1926 equals 100, weighted as follows: Steel rate 40, and car loadings power output and auto assemblies each 20.*

Business Position Is More Favorable Than Year Ago

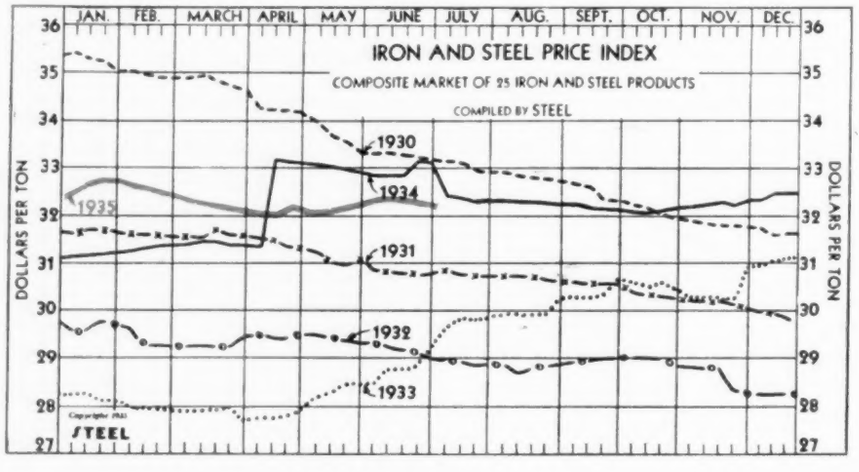
WHILE steel production, revenue freight car loadings and a number of other important factors were down slightly in the first half of 1935 as compared with the same period of 1934, the average of all lines of industrial activity showed a moderate gain.

This is shown clearly by the figures of the federal reserve board for industrial production. The average index number for the first five months of 1935 is 88, compared with 82 for the corresponding months last year. The June figure will increase the favorable showing of the half just ended.

This is corroborated by STEEL's index of activity in the iron, steel and metalworking industries. The average index for the 26 weeks in the first half of 1935 is 80.5, as against 76.4 for the first half last year. The gain, amounting to about 5 per cent, reflects not only the powerful influence of a favorable six months in automobile production, but also a marked improvement in the diversification of activity throughout branches of industry which suffered acutely in 1932, 1933 and 1934.

Builders of heavy machining and equipment are in a more favorable position. Machine tool builders, particularly, have experienced a marked lift in volume compared with that of the first half of 1934.

A year ago business was declining as it approached the July holiday week; this year, business was gaining strength before it eased operations for observance of Independence day. Consequently there is a sound basis for the hope that the rebound from the July 4 low will be more pronounced than it was last year.

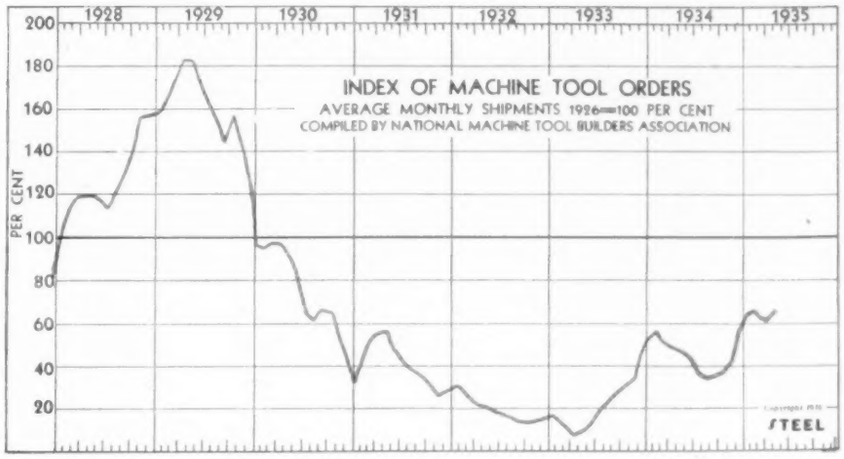


1935	
June 29	$32.39
June 22	32.40
June 15	32.41
June 8	32.45
June 1	32.43
May 25	32.41
May 18	32.34
May 11	32.34
May 4	32.30

1934	
June 30	$33.15
June 23	33.16
June 15	32.84
June 9	32.83
June 2	32.81
May 26	32.89
May 19	32.94
May 12	33.00
May 5	33.03

Machine Tool Index Up Sharply in May

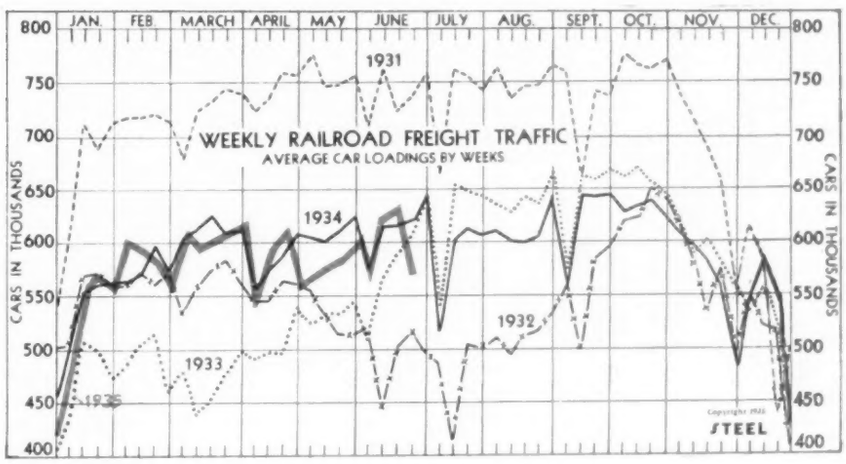
	1935	1934	1933	1932
Jan.	61.3	56.5	18.8	32.8
Feb.	61.5	58.2	15.2	30.4
March	60.3	50.9	11.1	23.9
April	60.3	48.5	8.3	20.6
May	67.1	46.8	10.6	20.8
June	.....	42.6	15.5	21.7
July	.....	38.6	22.4	18.7
Aug.	.....	37.1	27.9	16.8
Sept.	.....	37.4	30.9	15.3
Oct.	.....	40.5	33.3	15.7
Nov.	.....	44.2	38.0	16.4
Dec.	.....	54.1	51.0	17.6



Revenue Freight Car Loadings Off Sharply

1935

June 22	567,847
June 15	653,092
June 8	630,836
June 1	565,342
May 25	599,543
May 18	583,327
May 11	575,185
May 4	569,065
Apr. 27	558,886
Apr. 20	610,905
Apr. 13	587,685
Apr. 6	545,627

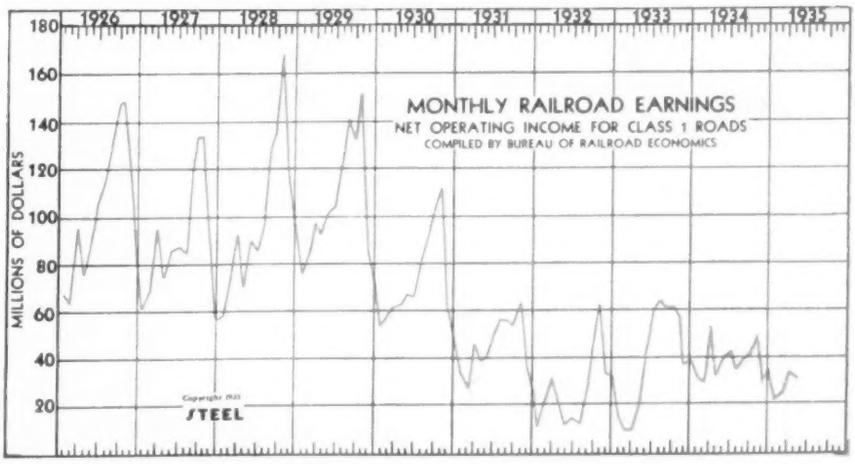


1934

June 23	623,322
June 16	618,881
June 9	616,768
June 2	579,656
May 26	625,990
May 19	612,331
May 12	602,798
May 5	605,246
Apr. 28	609,704
Apr. 21	591,705
Apr. 14	579,981
Apr. 7	559,070

Railroads Earn 1.81% in First Four Months

	1935	1934
Jan.	$21,348,557	$30,931,202
Feb.	25,719,919	29,281,013
March	37,850,965	52,037,848
April	34,625,786	32,264,610
May	.....	39,494,978
June	.....	41,836,302
July	.....	35,220,809
Aug.	.....	39,677,337
Sept.	.....	41,020,485
Oct.	.....	48,624,984
Nov.	.....	31,582,704
Dec.	.....	38,729,833



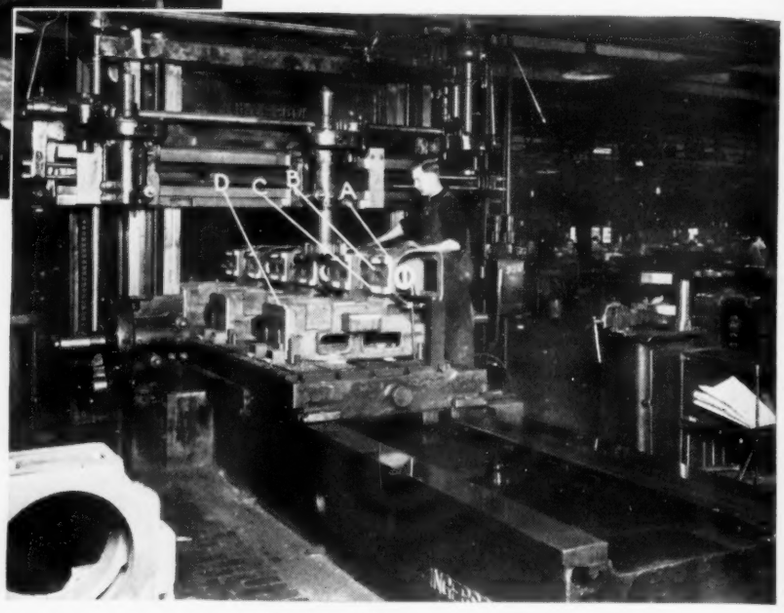


FIG. 1 (left)—Machinist checking a spindle carrier housing at the layout table to make sure it will "clean up" satisfactorily. Castings in the background at the left are headstocks. Fig. 2 (below)—Four-head milling machine, finishing surfaces, including A, B, C and D, on three spindle carrier housings. By machining as many surfaces as possible at one setting, accuracy is assured. Portable machinist's bench is shown at the right

PRECISION PRODUCTION OPERATIONS BUILD ACCURACY INTO MACHINE TOOLS

BY FRED B. JACOBS

PRESENT day high-grade machine tools operate more efficiently than their predecessors of a few years ago as a result of remarkable advances in construction methods whereby the necessary accuracy is a "built-in" feature. Thus, machine tools today are being built with limits of accuracy often as close as 0.0005-inch, plus or minus, from a given standard on various vital components. These close production limits, unheard of a few years ago, are brought about through use of high-grade heavy-duty machine tools in the production line and by adaptation of ingenious jigs, fixtures, gages and other special tools. An accurately built machine tool will turn out an accurate product and thus the ultimate user of such tools is assured close limit tolerances on his finished product.

Parts for Screw Machines

In this article are illustrated and described a few of the methods followed at the plant of the National Acme Co., Cleveland, in machining various components for Acme-Gridley automatic screw machines. The company is a pioneer in the manufacture of automatic machines and the methods followed are the result of years of constant development during which built-in accuracy of the finished product has been the constant aim.

A vast difference exists between machining large and small castings. If a small casting is spoiled in process of manufacturing the loss runs to a few dollars at most. On the other hand, if a comparatively large casting must be discarded during manufacturing the loss is serious as it involves not only an expensive casting, but perhaps many hours of machine labor as well. The comparative size of a few Acme-Gridley castings can be seen in Fig. 1 by comparing the castings with the machinist working at the layout table. The casting on the table is a spindle carrier housing for a 1¼-inch six-spindle machine. This size designates a machine which takes 1¼-inch stock through the spindles. The castings at the left in the background are headstocks.

To begin with, the castings are semisteel and they must be close grained and uniform in section. They are first roughed out on a planer-type milling machine and then normalized, the latter process requiring 24 hours at varying temperatures. They are then laid out for the final milling and boring operations. The effect of normalizing is to eliminate warping or changes in shape or dimension after manufacture or after assembly, without the necessity for prolonged aging.

The machinist in Fig. 1 is checking

a casting to make sure it will "clean up." There are, of course, a number of reasons why a casting might prove faulty. Shifted cores, for example, would result in surfaces which would not machine out correctly. Thus, the time to discover errors is before the casting is machined, for if several hours of machine work are put on a casting which then proves to be defective, the time is a total loss. The layout man in Fig. 1 checks each and every dimension from a blueprint. This of course is a time consuming operation on large castings, but it pays in the end.

In Fig. 2 is shown a four-head milling machine with an 18-foot platen and capable of taking work 63 inches wide and 46 inches high. Practically all surfaces on these large castings are finished by milling. In Fig. 2, three spindle carrier housings are strapped to the platen. Previous to this operation, however, the bottom surface and the surface at the extreme left were milled. In the present setup, surfaces at the right which do not show in the illustration are milled, the surface on which the cutter is working at present and also surfaces *A*, *B*, *C* and *D*.

The object is to machine as many surfaces as possible at one setting of the work. In this way the accuracy of these surfaces in their relation to each other can be controlled. After assembly, part of this spindle carrier housing will support cross slides, and these must be exactly at right angles to the spindle carrier itself and consequently to the work spindles.

The inserted tooth cutter shown in operation in Fig. 2 has high-speed steel cutting blades. It is 12 inches in diameter and is operated at a speed of 16 revolutions per minute with a 3-inch feed. Speeds and feeds of course vary with the nature of the work and the amount of material removed.

At the extreme right in Fig. 2 is shown the type of bench with which the machinist is provided. At the top is space for his tool box and beneath are two shelves. The benches are cast iron with pipe uprights. They are provided with casters so the bench can be moved about readily. Thus, if the machinist gets a job on another machine he moves his bench with him. This method eliminates time otherwise spent in going to and from a bench located some distance from the machine.

Several machining operations must be performed simultaneously on a

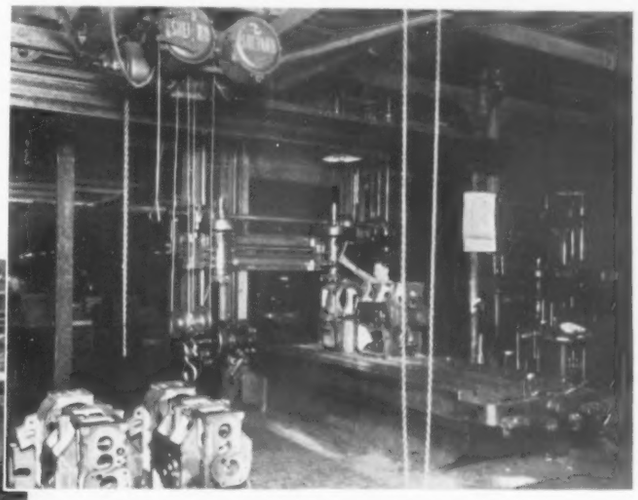
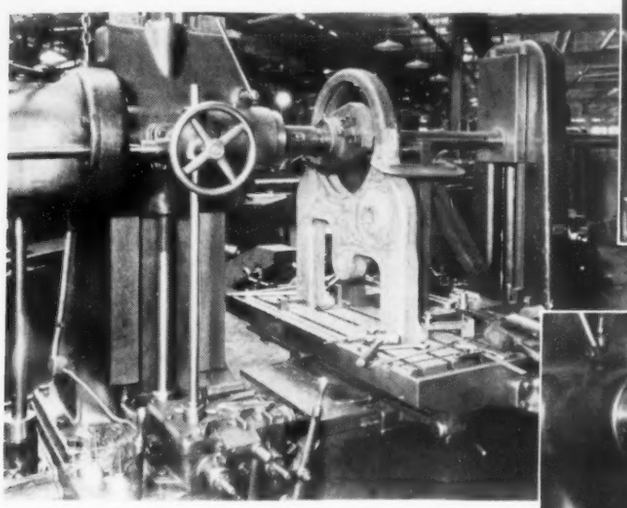


Fig. 3 (right) — Taking a milling cut over the upper surface of headstock and spindle carrier. Type of hoist for handling casting to and from machines also is shown



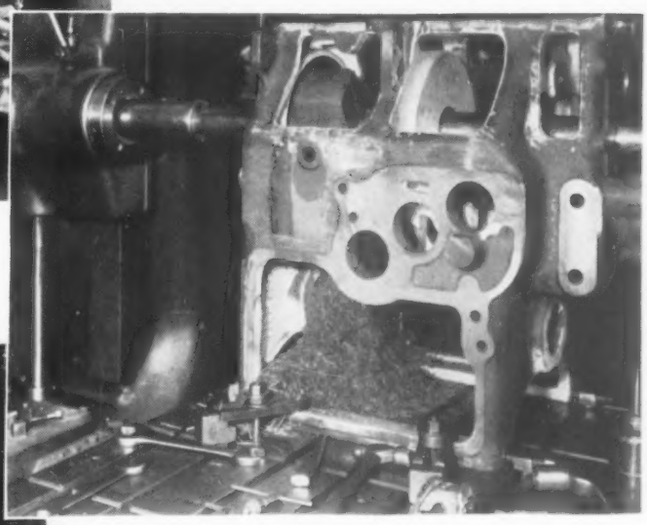


Fig. 4 (above)—Horizontal boring mill set up for machining drumshaft support bracket. Tolerance on the large hole is plus or minus 0.001-inch; on four smaller holes, 0.0001-inch

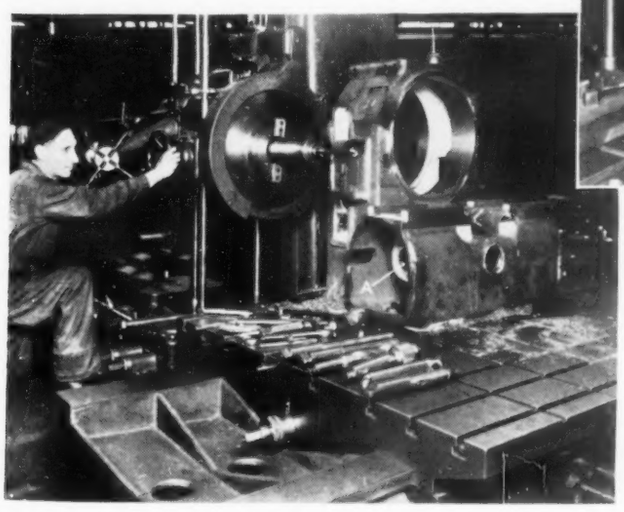


FIG. 5 (above)—Example of heavy work done on horizontal boring machine—counterboring a gearcase surface 12 inches in diameter and ½-inch deep. Visibility is aided by painting internal surfaces white. Fig. 6 (left)—Opening up a hole in a spindle carrier strapped to platen of horizontal boring mill. The casting is later turned at right angles for boring shaft hole A

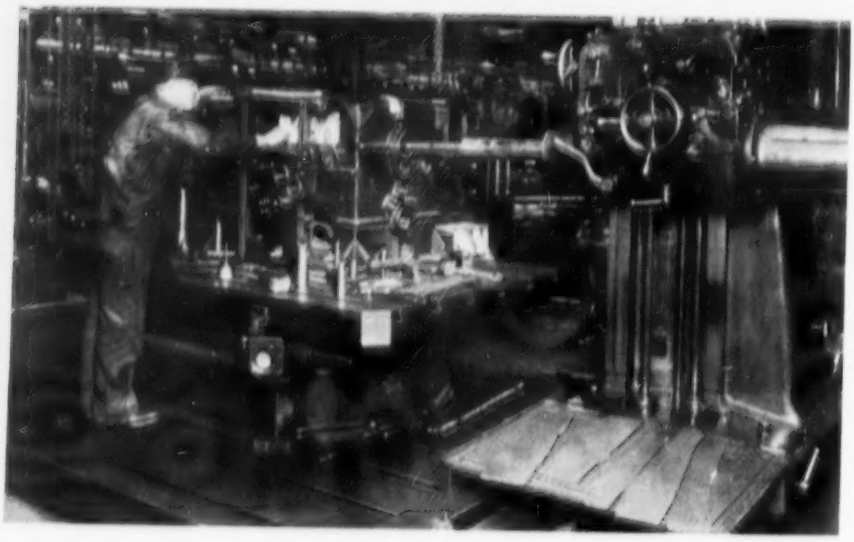


Fig. 7—Gearbox mounted in jig on horizontal boring mill with rotating table, permitting work on all four sides of part. Dial indicator assists accurate indexing of table

headstock and a spindle carrier, for these two units to be incorporated in the same machine must be identical as regards a number of dimensions. In Fig. 3 the machinist is taking a milling cut over the upper surface of the two parts in question. These castings must be the same height, for in the assembly they are tied together permanently by the pan (or base) below and by the top brace which is mounted over them.

In the operation in Fig. 3 the parts are lined up carefully and strapped directly to the miller platen. This illustration also shows the type of electric hoist for handling castings on and off various machines. The heavy machine tools are arranged in bays and each bay is equipped with a crane runway carrying several hoists.

Close Limits on Large Holes

A large variety of boring and milling operation are done on horizontal boring mills. In Fig. 4 is shown such a tool set up for machining a drumshaft support bracket. The hole being bored is 17.282 inches in diameter and it must be finished within a tolerance of 0.001 inch, plus or minus, which is a close limit for a hole of this size. As the illustration shows, the work is strapped to the machine platen and also is held securely against a heavy angle iron. A secure setting is of course necessary to prevent chattering. The boring head is fitted with two high-speed steel cutters and operated at an approximate speed of 18 revolutions per minute. Two cuts are taken, roughing and finishing. As the illustration shows, the rear end of the boring bar is supported to overcome chatter on heavy roughing cuts.

With the work set up as shown in Fig. 4 it also is necessary to finish four more holes. One hole is tapped 2-inch x 20, two holes are 2.500 inches, and one 3.000 inches. The limits on these holes are 0.0005 inch, plus or minus. The five holes machined at one setting of the work must be parallel to insure correct assembly in the finished machine. The bottom surface which locates it on the platen is milled before the boring operation. Accurate spacing of the holes as regards both horizontal and vertical dimensions is secured by using the micrometer dials with which the machine feedscrews are provided. As modern feedscrews are extremely accurate, they can be relied on to bore holes within close limits of spacing.

Handling Heavy Casting

In Fig. 5 is shown a good example of heavy work done on a horizontal boring machine. The casting has been given a coat of white paint over the internal surfaces to reflect light and thus give the operator better visibility in setting tools, etc. The cutting tool is the same type as previously described. The work on the machine platen is a gearcase for a $\frac{7}{8}$-inch machine and the operation consists of counterboring a surface 12 inches in diameter and $\frac{1}{2}$-inch deep. The counterboring tool is held on a boring bar as the illustration shows, and rotated at 12 revolutions per minute. The work is strapped directly to the machine platen and lined up with the platen slots. The tongue which locates the piece on the platen is the same which will locate it on assembly to the pan or base of the finished automatic screw machine.

The part shown in place on the machine in Fig. 6 is a spindle carrier for a 2-inch machine. The machine is a horizontal boring mill and, as the illustration shows, the work is strapped directly to the platen and lined up with the platen slots. The large hole which will accommodate the spindle carrier is 20 inches in diameter and it was finished with the type of boring tool shown in position on the machine in Fig. 4.

All the large holes in this casting are cored, but some of the smaller holes must be drilled and bored through solid metal. In Fig. 6 the machinist is opening up a hole that will afterward be bored with a single point boring tool held on a boring bar in the spindle. All holes square with the surface next to the boring head will be finished at one setting and the distances spaced off with the feedscrews as previously described. Then the casting will be located at right angles to this setting and the principal operation will consist of boring the shaft hole shown at A. As may be imagined, this work, together with the setting of the casting at right angles, calls for great care on the part of the machinist.

Making Use of Jigs

In the foregoing operations, the skill of the machinist is relied upon wholly for accurate spacings between holes. In many instances, however, these comparatively large machine tool castings are machined with jigs. An excellent example of this practice is shown in Fig. 7. This machine, another horizontal boring mill, is fitted with a rotating 5 x 7-foot table. The piece in the jig is a gearbox for a $\frac{7}{8}$-inch Acme-Gridley machine. This jig is of heavy box-type construction and has 36 bushings varying in size from $\frac{3}{4}$ to 3 inches. The machinist, of course, is provided with all the necessary boring bars, spot face tools, etc., to complete all operations while the part is in the jig.

The boring machine platen is mounted so it can be rotated in a complete circle. Thus the work can be machined from any of four sides. The boring bars may be solid members or they may be fitted with universal joints to overcome cramping.

The rotating table is provided with a dial indicator, shown in the illustration, which assures settings exactly square with each other. The bracket on the platen comes against a stop which actuates the dial indicator to bring it to the zero line to designate the correct setting. When the platen is swung around to the next 90-degree setting another bracket comes in contact with the indicator. By this means it is easy to assure accurate settings in less time than would be necessary if the platen had to be squared by other methods.

Fig. 8 shows another application of a jig to a horizontal boring mill. The part in place in the jig is a spindle carrier for a 9/16-inch model C Acme-Gridley five-spindle automat-

ie machine. With the jig in the present setting a 1¾-inch hole is bored to accommodate the lock bolt which holds the spindle carrier in place after it is automatically indexed. As the illustration shows, the jig is set at an angle and the setting is secured by the screw dowel A which works through a hardened bushing. On the other end of the jig is a similar screw dowel. By locating the dowel in the hole *B* the jig is set at another angle so that the bushing C comes into the horizontal plane.

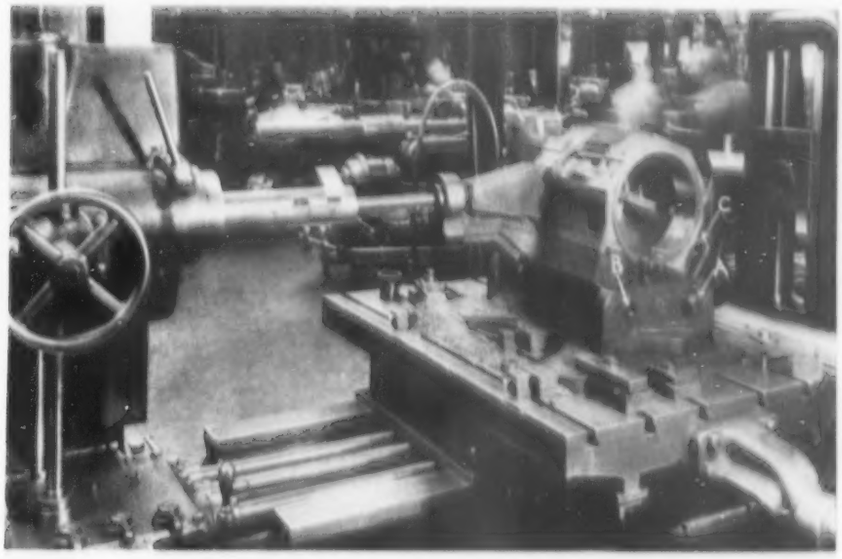


Fig. 8—Another application of a jig to a boring mill. Part is a spindle carrier and in present position jig is set at angle, secured by screw dowel A. By locating dowel in hole B, jig is set at different angle so bushing C comes into horizontal plane

Skilled Operators at Work

While the foregoing are only a few of the many machining operations constantly in progress at the National Acme plant they serve to show the great care necessary to insure the accuracy demanded in the finished machine. Such work cannot be done by the ordinary type of "handy man" to be found in almost any shop where manufacturing operations are performed. These operators must be machinists by trade who have had years of experience in the machine tool field. Many of them have been in the employ of the company for over 25 years and thus have become expert in their lines.

Riveted Steel Construction Features New Line of Heavy-Duty Trail Cars

RIVETED steel construction is employed largely in the manufacture of a new line of trail cars, in 8 to 25-ton sizes, just announced by the Austin-Western Road Machinery Co., Aurora, Ill. They are of the twin hopper type, with air controlled doors. The 20-ton car shown in the accompanying illustration weighs 12,700 pounds.

Sides are of ⅜-inch steel plates reinforced at the top edge with a 4 x 3½ x ½-inch angle, and at the bottom edge with a 5 x 3 x ½-inch angle, extending full length of the body and stiffened vertically by four 2½ x 2 x ¼-inch angles, and two vertical corner posts of 12-inch Z-bar, 19.2 pounds per foot, making a girder design.

The end slope sheet is of ⅜-inch steel plate, reinforced at the top edge by a 4 x 3½ x ½-inch angle, and angle reinforcement at the bottom. It is riveted to the side plates and has longitudinal angle stiffeners and one vertical cross support, made of a flanged plate. This makes a rigid construction that is supported vertically at each end by two angle posts.

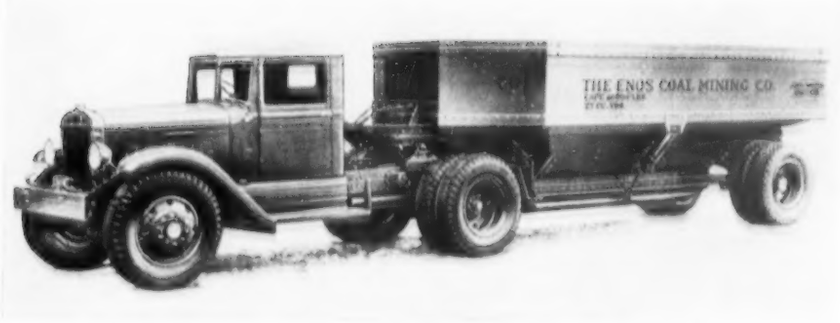
Side hopper plates are made of ⅜-inch steel plates, flanged at the top edge and riveted to the side plates and reinforced at the bottom edge with angles and two intermediate vertical angle stiffeners securely riveted to the sides. Sides and side hopper plates are reinforced and tied together transversely at the center of the trail car by means of ⅜-inch plates and gussets to prevent bulging.

The rear frame is made of a channel shaped cross member, securely riveted to intermediate and corner posts, and framed to the side bottom stiffeners with a gusset plate. Two longitudinal channel members are riveted to the pressed steel knee brace and the slope sheet stiffeners and tied together at the rear to the bumper channel, thus forming a compact unit to which are fastened the spring seats and shackles.

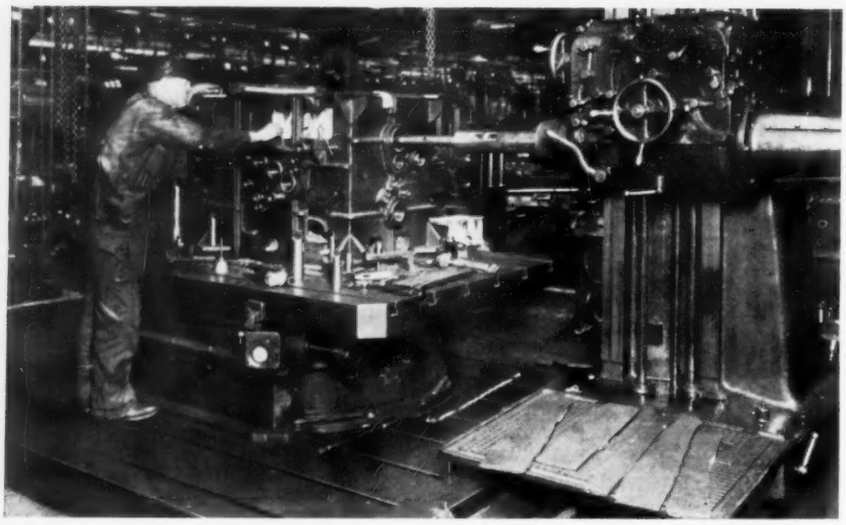
The front frame is made by so forming the side as to give sufficient clearance for the truck cab in turning; it is tied together at the bottom by a cover plate.

Doors are of clamshell design of ¼-inch steel plate, reinforced longitudinally with 4- and 5-inch Z-bars. The fifth wheel is of a special two-way oscillating type and is a steel casting. Tires are heavy service balloon. Main spring and auxiliary spring are semi-elliptic in shape and made of silico-manganese steel.

Axles are 6-inch tubular with spring seats welded on them; nickel alloy brake drums, 17½ inches in diameter x 5½ inches wide are used. Axle clips are of 1-inch round 3140 S. A. E. steel, formed to fit the tubular axle. Wheels are spoke type, pressed steel. Wheel hubs are steel castings with roller bearings and packed with proper heat resisting lubricant. Brakes are of the 2-shoe internal expanding type operated by compressed air. The brake chambers are mounted on the axle.



In new line of trail cars developed by Austin-Western Road Machinery Co., Aurora, Ill., riveted steel construction is employed on a large scale



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With the work set up as shown in Fig. 4 it also is necessary to finish four more holes. One hole is tapped 2-inch x 20, two holes are 2.500 inches, and one 3.000 inches. The limits on these holes are 0.0005-inch, plus or minus. The five holes machined at one setting of the work must be parallel to insure correct assembly in the finished machine. The bottom surface which locates it on the platen is milled before the boring operation. Accurate spacing of the holes as regards both horizontal and vertical dimensions is secured by using the micrometer dials with which the machine feedscrews are provided. As modern feedscrews are extremely accurate, they can be relied on to bore holes within close limits of spacing.

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The part shown in place on the machine in Fig. 6 is a spindle carrier for a 2-inch machine. The machine is a horizontal boring mill and, as the illustration shows, the work is strapped directly to the platen and lined up with the platen slots. The large hole which will accommodate the spindle carrier is 20 inches in diameter and it was finished with the type of boring tool shown in position on the machine in Fig. 4.

All the large holes in this casting are cored, but some of the smaller holes must be drilled and bored through solid metal. In Fig. 6 the machinist is opening up a hole that will afterward be bored with a single point boring tool held on a boring bar in the spindle. All holes square with the surface next to the boring head will be finished at one setting and the distances spaced off with the feedscrews as previously described. Then the casting will be located at right angles to this setting and the principal operation will consist of boring the shaft hole shown at *A*. As may be imagined, this work, together with the setting of the casting at right angles, calls for great care on the part of the machinist.

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Skilled Operators at Work

While the foregoing are only a few of the many machining operations constantly in progress at the National Acme plant they serve to show the great care necessary to insure the accuracy demanded in the finished machine. Such work cannot be done by the ordinary type of "handy man" to be found in almost any shop where manufacturing operations are performed. These operators must be machinists by trade who have had years of experience in the machine tool field. Many of them have been in the employ of the company for over 25 years and thus have become expert in their lines.

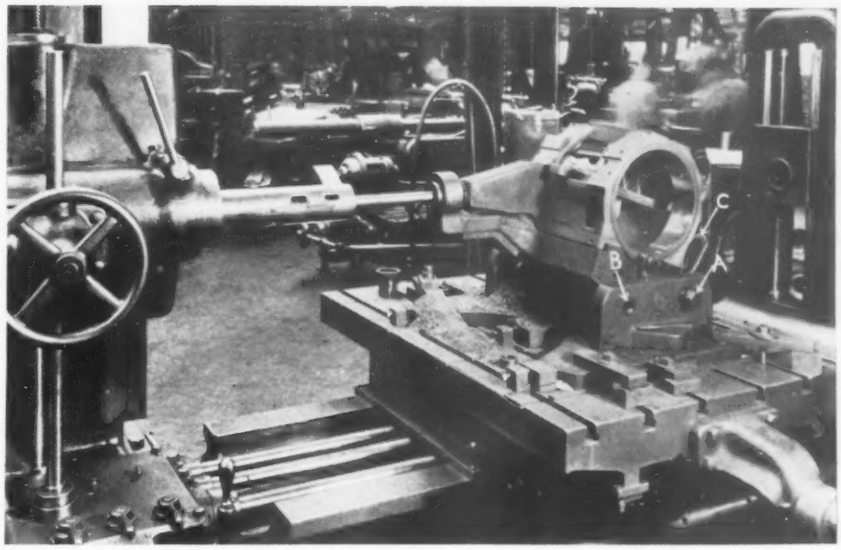


Fig. 8—Another application of a jig to a boring mill. Part is a spindle carrier and in present position jig is set at angle, secured by screw dowel A. *By locating dowel in hole* B, *jig is set at different angle so bushing* C *comes into horizontal plane*

Riveted Steel Construction Features New Line of Heavy-Duty Trail Cars

RIVETED steel construction is employed largely in the manufacture of a new line of trail cars, in 8 to 25-ton sizes, just announced by the Austin-Western Road Machinery Co., Aurora, Ill. They are of the twin hopper type, with air controlled doors. The 20-ton car shown in the accompanying illustration weighs 12,700 pounds.

Sides are of $\frac{3}{16}$-inch steel plates reinforced at the top edge with a 4 x 3½ x ½-inch angle, and at the bottom edge with a 5 x 3 x ⅜-inch angle, extending full length of the body and stiffened vertically by four 2½ x 2 x¼-inch angles, and two vertical corner posts of 4$\frac{1}{16}$-inch Z-bar, 10.3 pounds per foot, making a girder design.

The end slope sheet is of $\frac{3}{16}$-inch steel plate, reinforced at the top edge by a 4 x 3½ x ½-inch angle, and angle reinforcement at the bottom. It is riveted to the side plates and has longitudinal angle stiffeners and one vertical cross support, made of a flanged plate. This makes a rigid construction that is supported vertically at each end by two angle posts.

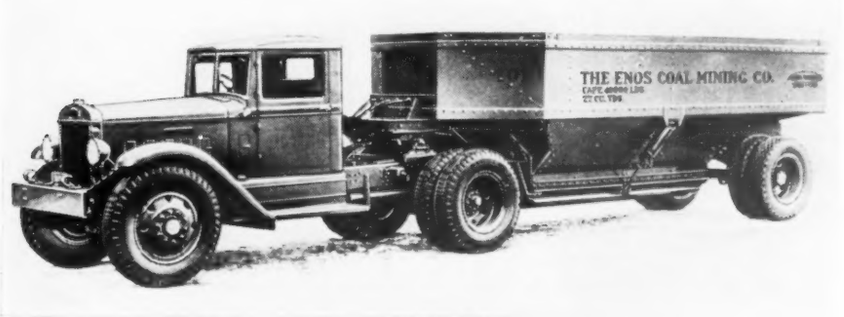
Side hopper plates are made of $\frac{3}{16}$-inch steel plates, flanged at the top edge and riveted to the side plates and reinforced at the bottom edge with angles and two intermediate vertical angle stiffeners securely riveted to the sides. Sides and side hopper plates are reinforced and tied together transversely at the center of the trail-car by means of $\frac{3}{16}$-inch plates and gussets to prevent bulging.

The rear frame is made of a channel shaped cross member, securely riveted to intermediate and corner posts, and framed to the side bottom stiffeners with a gusset plate. Two longitudinal channel members are riveted to the pressed steel knee brace and the slope sheet stiffeners and tied together at the rear to the bumper channel, thus forming a compact unit to which are fastened the spring seats and shackles.

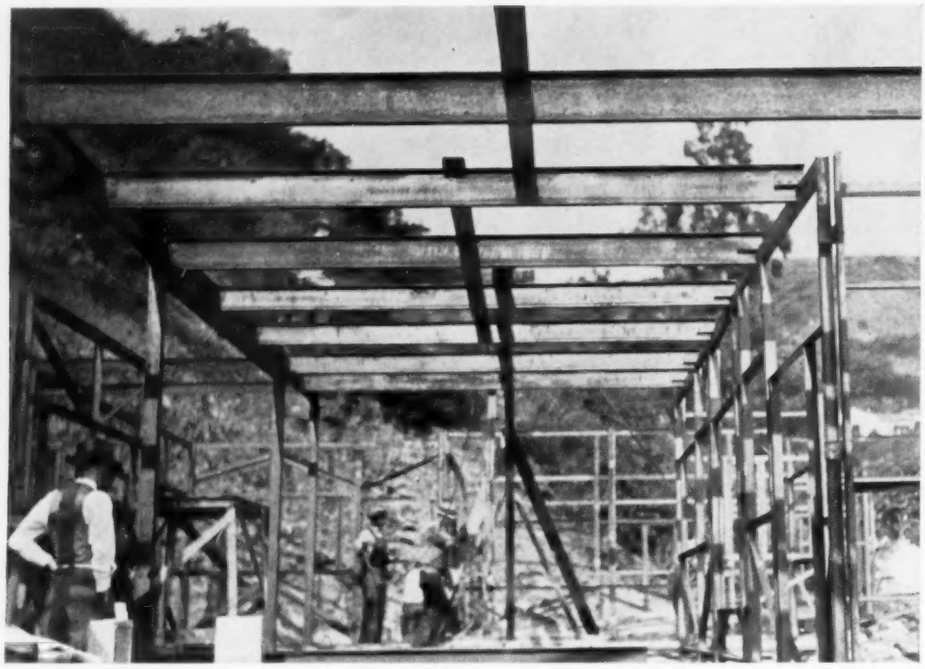
The front frame is made by so forming the side as to give sufficient clearance for the truck cab in turning; it is tied together at the bottom by a cover plate.

Doors are of clamshell design of ¼-inch steel plate, reinforced longitudinally with 4 and 5-inch Z-bars. The fifth wheel is of a special two-way oscillating type and is a steel casting. Tires are heavy service balloon. Main spring and auxiliary spring are semi-elliptic in shape and made of silico-manganese steel.

Axles are 6-inch tubular with spring seats welded on them; nickel alloy brake drums, 17¼ inches in diameter x 5½ inches wide are used. Axle clips are of 1 inch round 3140 S. A. E. steel, formed to fit the tubular axle. Wheels are spoke type, pressed steel. Wheel hubs are steel castings with roller bearings and packed with proper heat resisting lubricant. Brakes are of the 2-shoe internal expanding type operated by compressed air. The brake chambers are mounted on the axle.



In new line of trail cars developed by Austin-Western Road Machinery Co., Aurora, Ill., riveted steel construction is employed on a large scale



First-floor framing completely assembled and welded, ready for succeeding operations

Unit-Type Steel Frame for Residences Introduced on Pacific Coast

RIDING the crest of increasing popularity in metal-built homes is a new type of prefabricated frame dwelling recently introduced on the Pacific coast. The new frame system is known as Unitype, and is fabricated in sections at the plant and delivered to the building site in units. The units are assembled quickly and connections are field welded. A 12-room two-story residence of this type has been erected in Los Angeles.

A feature of the Unitype system is that it is made entirely of standard structural steel members readily obtainable on the market without resort to special sizes or shapes. The wall steel is made up of angles and channels, shop-fabricated into units of varying widths and one story in height. Members of the units are of structural steel cut to size and clamped into jigs for welding. The side members are channels with the flanges turned outward. Window and door openings are framed into the units at the shop. Angles and bucks are placed to receive the finished frames for the openings. Every unit is a self-sustaining wall section.

Side members of units are channels. The diagonal and horizontal bracing of units are steel angles set back ½-inch from the outside face of the unit. When ¾-inch steel furring channels are wired to the frame bracing, the thickness of walls from back of stucco to back of plaster is four inches, or a total wall thickness of 5¾ inches.

Each Unit Numbered

The usual method of erecting this steel frame is interesting. Each unit is numbered in the shop. Steel units for a certain wall section are delivered in one load and placed numerically along the wall. Workmen in pairs then raise the first story units by hand, and place each unit over anchor bolts in the foundation. The anchor bolts, coming up through steel bearing plates set on the concrete foundation, pass through a punched angle clip welded to the inside of each channel member forming the sides of the units. When nuts have been threaded onto the anchor bolts and tightened, the unit is securely in place, and the adjoining units are placed and bolted into position in the same manner.

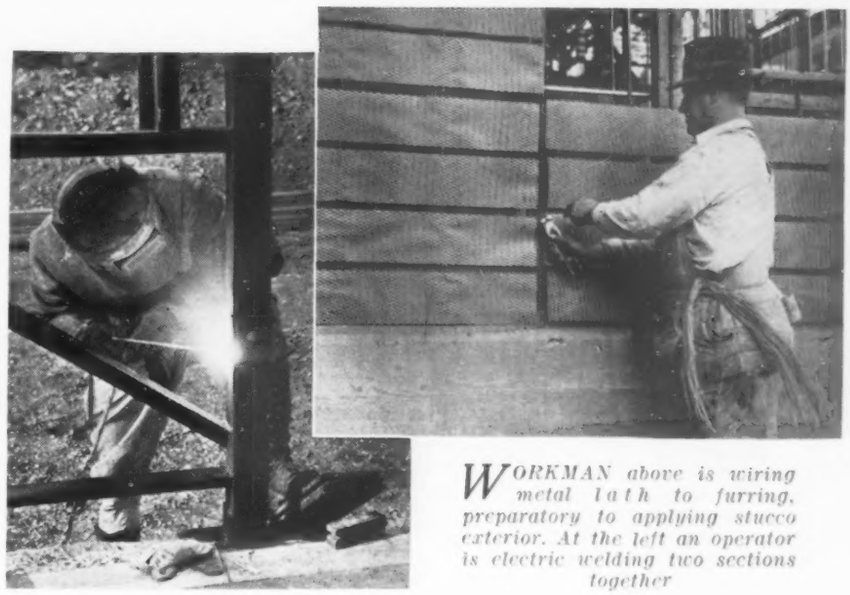
When two adjacent units are in position, the side channel members are secured together with a batten clamp, which later is permanently welded in place.

When all of the first floor units are bolted into place, each wall is checked to alignment and plumb, and the arc welder commences his work, welding the sections together. Whenever bolted connections occur each nut is welded to its bolt. Meanwhile the second-story units are being placed ready for welding in the same manner.

The method of joining the second-floor units to the first floor is simple. One hole is punched through the flange of the side channels near the top and bottom of the unit. The second-story unit is placed directly over the first-floor unit, with side channel members forming a continuous column. By means of the holes punched through the unit members a steel splice plate is bolted from the first-story units to second-story units and later welded in place. When second-story units meet and form a column not directly over the first-story column, the spandrel beam of the first-story unit is designed to carry the additional load, and the second-story columns are welded directly to the spandrel beam.

One unique construction feature is

that chimneys may be framed in steel, fabricated of angles and built in units, in which is suspended a galvanized sheet steel flue, lined with clay flue lining. The outside frame of the chimney may be lathed and plastered like the rest of the house. Metal lath is attached to the furring with wires to receive plaster or stucco finishes. No specialized labor is required to place the framing, it is said. Any style of architecture may be used. Among the advantages cited are permanency, high resistance to corrosion and fire, proof against termites and earthquakes. Five days only were required to erect the steel framing for the 12-story home erected in Los Angeles.



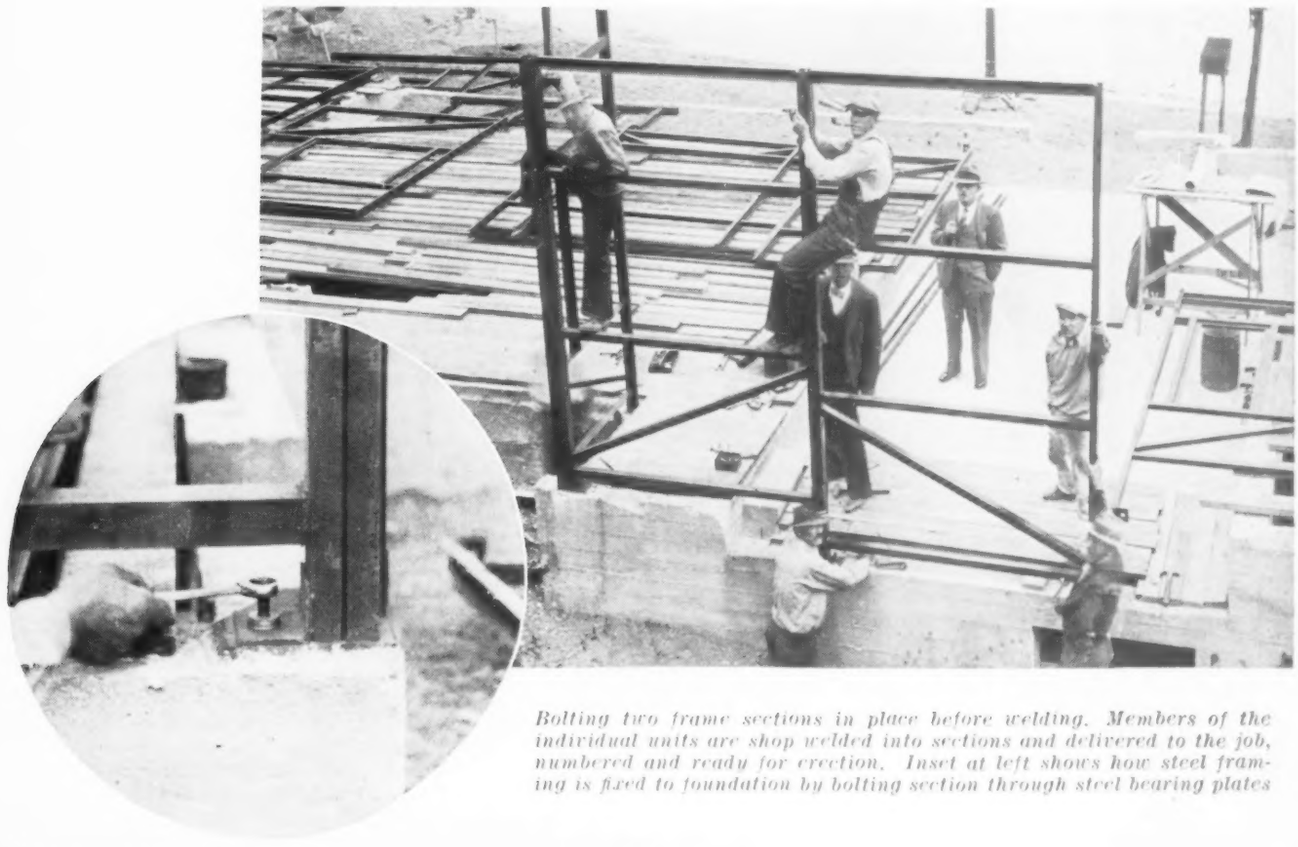
WORKMAN above is wiring metal lath to furring, preparatory to applying stucco exterior. At the left an operator is electric welding two sections together

Holds Cost Not Excessive

"Despite the many advantages of this sturdy type of residence and small business building construction, it costs surprisingly little more than ordinarily built structures," say E. H. Piersen, president of Unitype Builders Inc., 412 West Sixth street, Los Angeles. "There is perhaps not more than 10 per cent difference in cost now, and with the growth of this type, and getting into production, I am sure that the cost can be brought down to at least equal that of wood construction. Undoubtedly the steel home is to have a splendid reception. All indications point that way. The Pacific coast is particularly interested in it. I feel, like many other persons, that the next great swing in home building is to be in the direction of steel."

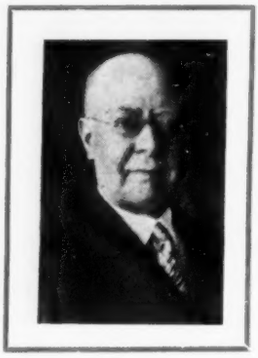
Behind the Unitype organization are several men well known to the construction industry. Edwin H. Piersen, president, is known widely as an executive in engineering and manufacturing lines and a pioneer in steel-frame construction. J. J. Jessup, vice president, was formerly city engineer of Los Angeles, and of Berkeley, Calif. Edwin F. Hyland, vice president, is an oil executive, and W. H. Metzdorf, vice president, has been identified with steel-frame development for several years. J. C. Anderson, chief engineer, is a steel engineer, formerly with the American Bridge Co., and Llewellyn Iron Works; and J. R. Heagy, general superintendent, was with the Los Angeles board of education in charge of school construction.

Co-operating with Unitype Builders in the introduction of this new construction is the Columbia Steel Co., a subsidiary of the United States Steel Corp.



Bolting two frame sections in place before welding. Members of the individual units are shop welded into sections and delivered to the job, numbered and ready for erection. Inset at left shows how steel framing is fixed to foundation by bolting section through steel bearing plates

To Buy or Not To Buy?



AUGUST H. TUECHTER,

President, Cincinnati Bickford Tool Co.,
Cincinnati,

SAYS:

TO BUY OR NOT TO BUY? Is that the real question users of machine tools face today? Is it not rather "To Buy Now or To Buy Later?" Every manufacturer who expects to remain in business knows that he must buy, must replace worn out and obsolete tools eventually. Until recently there may have been some logic in a policy of watchful waiting. But now a postponement of the modernizing and efficiency program may cause losses far beyond the cost of new equipment.

Postpone and Lose

The manufacturer who postpones the replacement of obsolete or inefficient tools stands to lose:

1. Savings in production cost due to greater efficiency of the new machines.

2. Savings in wages necessary to obtain the expert operators required for older machines, as compared with operating requirements of a modern tool, built foolproof, and eliminating to some extent at least the need for skill and experience on the part of the workman.

3. Cost of delaying and upsetting production schedules by installing new equipment and making plant changes at a later, busier time.

4. Profits on sales lost because of insufficient plant capacities and extended deliveries which will later prevail. This last factor may force the purchase at a later time to be based on delivery rather than on quality and preference, with consequent sacrifice of efficiency.

5. Savings in the cost of new equipment which is likely to have advanced in price at the time when urgent need compels purchase.

6. Cost of repairs and overtime labor necessary to obtain required production with old equipment.

As has been stated in these columns several times previously, only case studies will show where the greatest savings are to be made by modern equipment. Once these opportunities for saving have been located, procrastination is justified only when the manufacturer feels his business is "going to pot" or that by waiting a short time he can buy a still more advanced design, which will show even greater savings.

Development at Peak

On this last point let it be said that for the last four years engineering departments have been maintained almost solely for the purpose of perfecting new far-reaching designs. At the Machine Tool Show to be held in Cleveland this Septem-

". . . . The buyer today can be sure he is getting the latest and highest development—a machine which is unlikely to be radically improved for some time," declares Mr. Tuechter who on Saturday will celebrate the fiftieth anniversary of his association with the machine tool industry in Cincinnati. A past president of the National Machine Tool Builders association, Mr. Tuechter presents a strong case for replacing obsolete tools—today! This is the sixth in a series of articles devoted to reawakening interest in durable goods. Others will follow.

ber will be shown improved machines of 600 different types. Such an era of development will not be repeated for many years. The buyer today can be sure he is getting the latest and highest development — a machine which is unlikely to be radically improved for some time.

Now let us see what improvements make the drilling machine of today far more efficient than those of five to ten years ago. In general there are just two reasons: First, more accurate work and less tool breakage results from the greater rigidity of the improved designs; and second, time savings of great importance have been effected in the handling time required for these machines, as well as in the actual cutting time.

Controls Are Centralized

Handling time on both radial and upright drills has been reduced by eliminating the scattered controls of ten years ago and centralizing all of them at a convenient operating position. Ease of handling has been further promoted on radial drills by the comparative recent use of antifriction bearings as mountings for the column sleeve and for the head. These permit the arm to be swung and the head traversed with finger-tip ease. Lubrication on all modern drilling machines, both radial and upright types, now being largely automatic, requires little of the operator's time. Few operating adjustments of clutches, gibs and the like are now required because of better design and construction. Careless operation with its resultant time out for repairs is guarded against by many foolproof devices.

Power, Speeds Increase

Actual cutting time is reduced by greater power, permitting heavier feeds and more metal removal per minute. Contributing to this are higher spindle speeds made possible by antifriction bearings, precision gearings and again automatic lubrication. Furthermore, the greater number of speeds and feeds now provided permits the use of the most efficient speed and feed without compromise.

All these factors combine to make the modern drilling machine so much more efficient and economical that drills ten years old, and many of less age, are wasting money. From a personal experience of 50 years in the machine tool industry one fact stands out. It is this—you pay for efficiency whether you have it or not. Why not have it?

A.F.A. Announces Program For Toronto Convention

PLANS are rapidly rounding into shape for the thirty-ninth annual convention of the American Foundrymen's association to be held in the Royal York hotel, Toronto, Ont., Aug. 20-23. It has been a number of years since the foundrymen have met in Canada and this is stimulating interest, furthermore, the annual Canadian National exposition opens on the closing day of the convention.

According to the tentative technical program just announced by the association, a wide range of foundry and related topics will be considered at sessions continuing over four days.

Five sessions, including a symposium and a luncheon conference, will be devoted to cast iron. Three sessions, including a luncheon conference, will deal with nonferrous castings; and two sessions, including luncheon conferences, will consider steel castings and malleable cast iron.

Single sessions are scheduled for foundry sand research, refractories, materials handling and foundry equipment, foundry costs, apprentice training, steel founding, industrial health hazards, and dust control. Shop courses, of three meetings each, are being arranged on foundry sands and cast iron.

Two afternoons will schedule plant visitations to foundries in the Toronto area. Social activities will include the annual dinner on the evening of Aug. 22.

The tentative program of papers and speakers is as follows:

Monday, Aug. 19

Committee meetings.

Tuesday, Aug. 20

MORNING

Opening Meeting

Address of welcome, by L. L. Anthes, chairman, Toronto foundry committee.

Response, by President D. M. Avey, editor, *The Foundry*, Cleveland.

Reports of officers.

Cast Iron

"Impact Resistance and Other Physical Properties of Alloy Cast Irons," by G. P. Phillips, International Harvester Co., Chicago.

"Heat Treatment of Cast Iron," by R. G. McElwee, Ecorse Foundry Co., Ecorse, Mich.

"Hardening Anneal of Austenitic Iron," by G. R. Delbart, Denain, France.

Foundry Sand Research

"Expansion and Contraction of Molding Sand Under Elevated Temperatures," by H. W. Dietert, H. W. Dietert Co., Detroit.

Report of committee on tests.

Report of committee on durability.

Report of committee on fineness.

AFTERNOON

Plant visitation.

EVENING

Sand Shop Course

Session 1—"New Sand Qualities." Chairman: Neil I. MacArthur, Great Lakes Foundry Sand Co., Detroit. Discussion leader: George F. Pettinos, George F. Pettinos Inc., Philadelphia.

Cast Iron Shop Course

Session 1—"Special Irons from High-Frequency Electric Furnaces."

Refractories

"Insulation of Furnaces Applicable to Foundries," by A. V. Leun, Bethlehem Steel Co., Bethlehem, Pa.

"Malleable Furnace Refractories," by L. C. Hewitt, Laclede-Christy Clay Products Co., St. Louis.

"Importance of Equilibrium Studies in Cupola Refractories," by A. H. Dierker, Ohio State university, Columbus, O.

Wednesday, Aug. 21

MORNING

Malleable Cast Iron

"Endurance Tests of Malleable Iron," by E. G. Mahin, University of Notre Dame, Notre Dame, Ind., and J. W. Hamilton, Bendix Products Corp., South Bend, Ind.

"Effects of Various Elements on Malleabilizing, by O. W. Ellis, Ontario Research Foundation, Toronto, Ont.

"Notes on the Production of Cupola Iron Fittings," by F. B. Riggan, Stockham Pipe & Fittings Co., Birmingham, Ala.

Report of committee on specifications.

Report of committee on nomenclature.

Materials Handling and Foundry Equipment

"Mechanical Charging for Small Tonnage Foundries," by D. J. Reese, Whiting Corp., Harvey, Ill.

"Mechanical Handling of Sand and Castings for Small Tonnage Plants," by E. W. Beach, Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich..

Cast Iron

"Structure and Properties of Gray Cast Iron," by A. Di Giulio and A. E. White, University of Michigan, Ann Arbor, Mich.

"Railroad Castings," by A. Reyburn, Canadian National Railways, Montreal, Que.

"Piston Rings," by T. R. Twigger, British Piston Ring Co., Coventry, England.

Foundry Costs

Program to be announced.

AFTERNOON

Plant visitation.

EVENING

Industrial Health Hazards and Employer Responsibility

Address, by Dr. William J. McConnell, assistant medical director and director, industrial health section, Metropolitan Life Insurance Co., New York.

Address, by Donald L. Cummings, assistant director, Saranac Laboratories, Saranac, N. Y.

Cast Iron Shop Course

Session 2—"Relation of the Air Charge to Cupola Operation," by H. V. Crawford, General Electric Co., Schenectady, N. Y.

Sand Shop Course

Session 2—"Foundry Sand Problems Where Natural Sands Are Used." Discussion leader: Horace Deane, John Deere Co., Moline, Ill.

Thursday, Aug. 22

MORNING

Sand Shop Course

Session 3—"Synthetic Sands." Discussion leader: R. F. Harrington, Hunt-Spiller Mfg. Corp., Boston.

Cast Iron Shop Course

Session 3—"Adding Ferroalloys in the Cupalo," by E. K. Smith and H. C. Aufderhaar, Electro Metallurgical Co., Chicago.

Apprentice Training

"15 Years of Foundry Apprenticeship at the Falk Corp.," by Victor Hydar, director of personnel, Falk Corp., Milwaukee.

"Some Suggestions for Starting and Carrying Out a Foundry Apprenticeship System," by J. E. Goss, employment manager, Brown & Sharpe Mfg. Co., Providence, R. I.

Nonferrous

Third annual conference on "Deoxidation and Degasification of Nonferrous Metals."

Annual business meeting, nonferrous division.

Steel

"Contraction and Solidification of Steel for Castings, III — The Rate of Skin Formation," by C. W. Briggs and R. A. Gezelius, naval research laboratory, Anacostia, D. C.

Report of committee on impact tests.

Report of committee on chemical classification of steels for castings.

Report of committee on specifications.

Cast Iron

Centrifugal Casting Symposium

"Production of Centrifugal Gray Iron Castings in Water-Cooled Molds," by H. W. Stuart, U. S. Pipe & Foundry Co., Burlington, N. J.

"Slush Pump Piston Cores by the Centrifugal Process," by A. E. Falk, D & M Machine Co., Torrance, Calif.

"Cast Iron Pipe Centrifugally Cast in Sand," by J. T. MacKenzie, American Cast Iron Pipe Co., Birmingham, Ala.

"Centrifugal Castings," by J. E. Hurst, Sheepbridge Stokes Centrifugal Casting Co., Chesterfield, England.

AFTERNOON

Round Table Luncheon Conferences

Steel—Chairman: A. W. Gregg, Farrell-Cheek Steel Foundry Co., Sandusky, O.

Malleable Cast Iron—Chairman: P. C. DeBruyne, Moline Malleable Iron Co., St. Charles, Ill.

Nonferrous—Chairman: H. J. Roast, Canadian Bronze Co. Ltd., Montreal, Que.

Cast Iron—Chairman: W. H. Spencer, Sealed Power Corp., Muskegon, Mich.

Annual Business Meeting

Election of officers.

EVENING

Annual dinner.

Friday, Aug. 23

MORNING

Steel Founding

"Utilization of X-Rays in the Correction of Foundry Practice and for the Proper Control of Welding of Castings," by Mr. Underwood and E. J. Ash, naval gun factory, Washington.

"Temperature Gradients," by George Batty, Philadelphia.

Cast Iron

Report of international committee on

tests, by W. H. Spencer, sealed Power Corp., Muskigon, Mich.

"Wear Resistance of White Cast Iron," by O. W. Ellis, J. R. Gordon and G. S. Farnham, Ontario Research Foundation, Toronto, Ont.

Dust Control and Safety Codes

"Dust Collection Equipment," by S. D. Moxley, American Cast Iron Pipe Co., Birmingham, Ala.

Report of safety codes of American Standards association.

Nonferrous

"Founding of Magnesium Alloys," by Dr. J. A. Gann, Dow Chemical Co., Midland, Mich.

"High-Strength Nonferrous Casting Alloys," by A. J. Murphy, J. Stone & Co. Ltd., Deptford, London, England. Exchange paper submitted on behalf of Institute of British Foundrymen.

"Report of committee on analysis of defects, by H. M. St. John, Detroit Lubricator Co., Detroit.

AFTERNOON

Canadian National Exposition.

British Institute Considers Alloys and Corrosion Work

BY VINCENT DELPORT
European Manager, STEEL

IN A scientific sense, an alloy may include everything except a pure metal, but in its general sense it should signify a metal to which other elements are added or in which they are allowed to remain to obtain certain desirable properties at an economic price. So stated Sir Harold C. H. Carpenter, Imperial College of Science and Technology, London, in making his address as the new president of the British Iron and Steel institute at the institute's annual meeting in London recently.

Sir Harold said that "considered as a whole, the study of alloys has followed a very devious route, but it has always proceeded in the same general direction, namely, toward a fuller comprehension of the subject and an ability to produce a greater variety of useful and reliable alloys."

Dealing with the study of alloys, he stated that "when we know that a certain result may be obtained by a particular sequence of treatments, we utilize this knowledge, but we are not satisfied until we know why this sequence gives that particular result. We are then in a position to modify this treatment so as to secure even better results, and, furthermore, we can often produce other alloys that will be improved by similar treatments."

Properties Are Reviewed

In connection with the composition of alloys, he said that "when composition is considered alone without regard to treatment, its importance is seen to vary greatly with the properties we have in mind." The various properties were passed under review, including electrical conductivity, magnetic properties, chemical properties, the latter section comprising the important group of alloys resisting to corrosion and heat. The constitution and structure of alloys, including equilibrium diagrams, was dealt with and was followed by a section on transformations in solid alloys.

Summing up his address, the president stated that composition is the first factor to be considered in connection with the properties of an alloy. Composition is fixed when the alloy is cast, while the other factors are influenced by the casting technique, and the heat and mechanical treatment of the solid metal.

Sir Robert A. Hadfield referred to the importance of metallurgy in connection with the study of alloys, which, under present conditions, are no longer prepared by rule-of-thumb. He pointed out that almost 10 per cent of steel production is alloy steel, and he emphasized that even more important than the actual percentage of production are the characteristics and uses of alloy steels in modern engineering.

Corrosion Report Submitted

One feature of the meeting was presentation of the third report of the corrosion committee, by a joint committee of the Iron and Steel Institute and the British Iron and Steel Federation, the first and second reports of this committee having been presented in 1931 and 1934, respectively. Dr. W. H. Hatfield, director, Brown-Firth Research Laboratories, Sheffield, is chairman of this committee, and the present report comprises five sections, which deal with the constitution of the committee and the present position of the committee's work; progress of the committee's field tests on atmospheric corrosion; marine corrosion; seven individual contributions by members of the laboratory research sub-committee and other investigators; and other matters relating to corrosion.

Opening the discussion, T. H. Turner, referring to the use of paint to prevent corrosion, said that paint hides possible defects, and that the aim of investigations on corrosion should be to find something to prevent corrosion without use of coverings. He pointed out that a rail will last as long as a man in the open, but in a tunnel it would last only three years, owing to acid fumes and humidity.

Referring to the fact that bridges and similar structures appear to be more prone to corrosion when partly scaled, he questioned how far one can go in practice in completely removing the scale on such a structure as a bridge. Another speaker, dealing with the subject of ships' hulls, suggested that investigations should not be limited to the outside, but should also be made inside the hull, which is not subjected to mechanical deterioration. Referring to riveted structures, he emphasized the importance of making sure that all rivets used in one structure are of the same quality.

Blast Furnace Heat Losses

A paper, "Further Determinations of the External Heat Loss of Blast-Furnaces," by D. F. Marshall, Sheffield, was a record of an experimental determination of the external heat loss from four blast furnaces. Results indicated the external heat loss to be largely a function of the superficial area of the furnace and to be considerably lower than previous estimates. In all cases, cooling water used accounted for more than 83 per cent of the total heat loss, and it seems probable that a study of this loss might result in improvements in furnace operation.

J. H. Whiteley, Consett Iron Co. Ltd., presented a paper on "An Effect of Oxygen and Sulphur on Iron in Scaling," in which it was explained that a network structure forms at the boundaries of either alpha or gamma surface grains when steel is scaled. In discussion, Dr. C. H. Desch suggested that an approach to the subject might be made, starting from pure iron and studying the effects of silicon and oxygen.

"An investigation of Spring Steels" was the title of a paper presented by Prof. J. H. Andrew and G. T. Richardson, department of metallurgy, University of Sheffield. This paper dealt with investigations of the manufacture of spring steels, from the billet stage to that of the heat-treated plate. From the purely metallurgical standpoint, it appears that the chromium-vanadium steel is the easiest to treat, and, generally speaking, gives best results.

In discussion, it was pointed out

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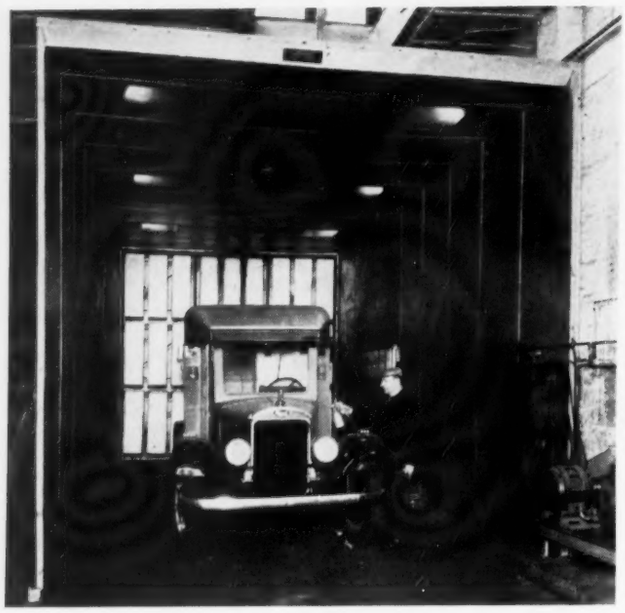


SPRAY equipment, including guns, pressure tanks and supports, booths and exhaust equipment annually require a fair tonnage of various steel products in their manufacture

—Courtesy Binks Mfg. Co., Chicago

LARGE USES OF STEEL IN SMALL WAYS

290th Article ◆ Spray Equipment

MANUFACTURE of equipment for spraying paint and enamel involves the use of a variety of steel products. While a large portion of the steel consumed annually is required for spray booths, spray units also take a moderate quantity.

The market for spray equipment is wide, including manufacturers of the many products which require some form of a decorative or protective coating. In some instances the spray gun is substituted for the paint brush in painting building interiors and exteriors. The automotive industry, principally body building divisions, is one of the largest single users of spray equipment.

Use Stainless in Guns

Spray guns are made principally of bronze and aluminum. These may have a body and air nozzle of drop forged bronze, with a die cast aluminum handle. In latest types, however, the fluid nozzle and needle valve are of stainless steel to resist the abrasive action of the spray which is particularly severe in the case of vitreous enamel. Use of stainless steel for these vital parts prolongs their life substantially and permits working the gun with high pressure. It is estimated that consumption of stainless steel for this purpose is around 15 tons annually.

Pressure tanks and portable spray units are made to a large extent of steel. Pressure containers are employed for uninterrupted spraying of paint or enamel, usually being made in 5, 10, 15, 30 or 60-gallon capacities of seamless drawn steel, galvanized inside and outside.

Numerous Accessories

Portable spray painting units are made in various sizes and are equipped with motor or internal combustion engine and compressor mounted on a pressed steel base or, in the case of the largest types, on a four-wheel steel truck.

Spray booths generally are made of galvanized steel sheets and steel angles. These are made in various sizes, those among the largest being about 12 feet wide, 9 feet high and having a working depth of 18 feet, although units of greater dimensions are obtainable. Exhaust equipment involves additional use of flat-rolled steel.

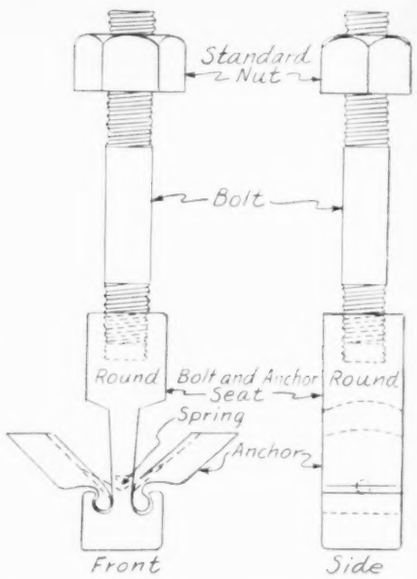
Other accessories used in spray painting and enameling, such as compressor tanks, turntables for handling articles while being sprayed, brushing tables where excess enamel is removed and feed material containers and strainers represent further steel consumption. In many plants overhead or chain conveyors of steel are employed for handling the products in the paint or enamel shop.

18-8 Stainless Steel Tough At Subzero Temperatures

A company recently had an application in which 18-8 chromium-nickel stainless steel would be logical provided it would have the necessary toughness at subzero temperatures. The low-temperature properties of 18-8 are said to be excellent, and there need be no hesitancy in using it on that score. This alloy is claimed to remain tough and ductile at temperatures down to —300 degrees Fahr., provided it is not underalloyed to the extent that it will transform at the lower temperature.

A Manufacturer Wanted

New expansion bolt, for anchoring motors and machines to concrete and wood floors, and for hanging pipes, conduits, pulley supports and other units from ceilings, has been developed and patented by J. Roy Gattis, Route 5, Box 4, Milledgeville, Ga., who desires to arrange for its manufacture. The bolt is made of steel rounds, with slotted sides into which the anchors fit. The anchors are connected by a length of spring wire coiled through the bolt, thus holding the anchors in the spread position. Front and side sections in the drawing show its construction. The anchor section is fitted with a standard size stud, with standard nut, and the length of stud can be varied to suit specific requirements.



"Upson's the top as far as I'm concerned." This, in effect, is what the purchasing agent of one of the largest manufacturing plants in the country said recently when commenting on Upson quality and service. And that he isn't alone in his favorable attitude is attested by the steady stream of business that daily keeps the tremendous Upson plants busy turning out standard and special headed and threaded products of every kind.

A cross-section of any day's orders at Upson is a cross-section of industry the country over. Track bolts and railroad locomotive pins—stainless steel bolts for dairy machinery—plow and cultivator bolts for an agricultural equipment maker—hundreds of different items for automobile makers—valve parts of fine alloy steel for a big western dam project—and carload shipments of assorted items for supply houses everywhere.

Upson quality is always the same—it never varies from the best steel and the finest craftsmanship—and that's why Upson is the top.

Bolts and nuts in all stardard and special shapes, sizes, alloys and finishes. Standard and special rivets of all kinds. Wire rope clips. Turnbuckles. Automotive and railroad special items. Headed and threaded products for every use. Your specialties are our specialty.

UPSON NUT DIVISION · · · CLEVELAND, OHIO

Republic Steel CORPORATION

GENERAL OFFICES · · · YOUNGSTOWN, OHIO

METHODS AND MATERIALS

Nickel Steel Tape Permits More Accurate Surveying

Among the interesting applications of Invar, the 36 per cent nickel steel, which in the normal temperature ranges has the lowest coefficient of expansion of any commercially available metal, is that of tape for surveying, according to the June issue of *Nickel Steel Topics* published by the Internationel Nickel Co. Inc., New York.

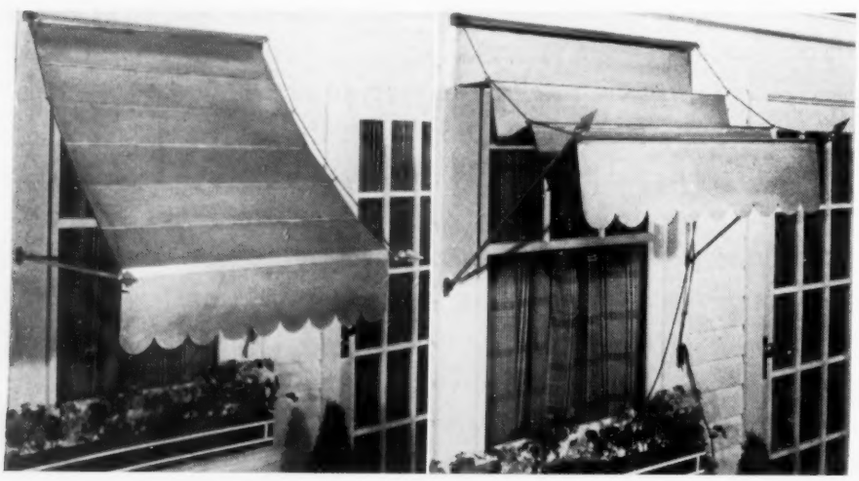
Ten years ago, a treaty was signed at Washington which provided for the maintenance of a boundary line between the United States and the Dominion of Canada. The two countries were to assume joint responsibility for establishing the line and marking it.

What is Canadian and what is American soil is a question of moment when the legal rights of rum runners, fishermen, immigrants who try to steal across the border, and smugglers in general, are involved. It matters much whether these violators of the law are captured on Canadian soil or our own. Nice problems in jurisdiction are raised.

The compass and chain are not good enough for such work in these days of precision instruments. Invar tapes and the familiar theodolite of the surveyor now make it possible to run lines with extraordinary accuracy over hill and dale and over wide expanses of water.

The Invar tape, which replaces the old-fashioned chain, is 50 meters long. An error of 1 degree Cent. in a steel tape of the kind once used is enough to throw out the measurement by 1 centimeter in 1 kilometer, or 1 part in 100,000. The required accuracy permits an error of only 1 part in 300,000. Actually, a base line measured with an Invar tape is out by not more than 1 part in 1 million.

Now the Steel Awning



SHEET STEEL FINDS NEW APPLICATION in a patented type of folding metal awning, marketed by the Metal Awning Corp., 19 East Forty-seventh street, New York. The awning is made of steel specially treated for corrosion resistance, and is painted in either stripes or solid colors. The steel varies in thickness, averaging around 0.022-inch. For the average single window, such as shown, the awning weighs about 27 pounds, or approximately 9 pounds to the running foot. All movable parts, such as hinge pins and fittings, are of bronze. The awning also is available in copper and aluminum. Initial cost is said to be only slightly higher than for the ordinary fabric awning, and the metal awning lasts indefinitely. In addition to being attractive and simple to operate and install, it is fireproof and keeps rooms cooler since it deflects the sun's rays, instead of permitting them to penetrate, as in the case of fabrics. This type also performs a ventilating function, for with the top window sash lowered slightly, the awning, even when folded, provides protection against the weather.

Side arms are of steel tubing, $\frac{3}{8}$-inch in diameter and 30 inches in length

Wants Help in Developing Hydraulic Control Units

"We are contemplating the development of a hydraulic control for our machinery," writes a reader of STEEL. "If you know the names of any engineers or firms that have specialized in small hydraulic units, please give us that information. There have been some new developments, such as chromium plating of cylinders for wear resistance, of which we know very little. If we could get in touch with the right engineers or manufacturers, it would assist us materially."

s s s

Ingot Pouring Eliminates Piping in Steel Shafts

In a prominent steel foundry operated as part of a manufacturing plant, ingots for shafts are poured in the top of the mold. A timing device has been established for the various sizes so that a maximum time is allowed for filling the mold without the forma-

This Sunoco Cutting Oil advertisement is occasioned by the 125th anniversary of Lukens Steel Company, Coatesville, Pennsylvania

The Sun Oil Company knows no better way to summarize Sunoco Cutting Oil's efficiency than to say it is used by leaders of the metal cutting industry. On performance, and performance alone, it has won recognition wherever machine tools are operated.

CENTURY AND QUARTER

★ And Lukens' Long Experience Selects Sunoco

As a producer of lubricants, Sun is privileged to contact many firms in many lines. It is a special privilege now to look backward—and forward—with Lukens Steel Company . . . Backward over many years of business relations . . . Forward to years, freighted with promise, which lie ahead. ★ ★ ★ And Sun takes pleasure in reporting long-continued use of Sun products by Lukens—not the least among them Sunoco Emulsifying Cutting Oil. That the Lukens' mechanical department should state its satisfaction with this cutting lubricant and report the fact that Sunoco "carries off very rapidly the frictional heat, and leaves a smooth, non-rusting finish" is indeed gratifying . . . and significant. ★ ★ ★ *SUN OIL COMPANY, Philadelphia.*

Operation: Milling keyway on drive shaft for 206" mill.
Machine: Brown and Sharpe Milling Machine.
Material: Forged steel; .30 carbon.
Feed: 5/8" per min. **Speed:** 280 r.p.m.
Depth of Cut: 3/8". **Width:** 1½".
Lubricant: 1 part Sunoco to 8 parts water.

In Oval: The old mill of Lukens Steel Company. Bottom Pictures: Two views from today's Lukens plant, showing use of Sunoco in machine shop.

Operation: Drilling hole in front table roll gudgeon for 206" mill.
Machine: Fosdick Drilling Machine.
Material: Cast steel.
Feed: .013" per revolution. (255 r.p.m.)
Size of Drill: 1½".
Lubricant: 1 part Sunoco to 8 parts water.

tion of cold shuts. In this manner, solidification commences at the bottom and travels gradually and slowly upward. With this method piping practically is eliminated. Metal flows through a 1½-inch nozzle from the bottom of the ladle into a loam or brick-lined pouring basin or reservoir set on top of the ingot mold. A small opening in the bottom of the reservoir admits the metal to the mold. While the static pressure drives the metal through the ladle nozzle with considerable force, the force is absorbed by the pool of metal in the reservoir and as a result the metal falls into the mold in a gentle stream.

S S S

Parts for Pigment Mill Are Made from 18-8 Sheets

An interesting use for 18-8 chrome-nickel, corrosion - resisting steel in 8 to 10-gage rolled sheet form has been developed for a five-roll pigment mill recently placed on the market by the J. H. Day Co., Cincinnati, manufacturer of bakery, paint and special machinery.

Guard plates and discharge tables are both fabricated out of the 18-8 material. The guard plates are made of 18-gage material sheared, rolled, formed and electric welded. There are four separate pieces constituting these plates. The discharge table or apron, however, is only formed and welded and is fabricated out of 8 to 10-gage material.

This type of steel was chosen to prevent discoloration when coming in contact with solvents, as well as to avoid any chemical action from the ground product when passing or contacting the metal. After each run, and when changing from one color to another, the mill's fabricated steel parts just referred to are taken from the machine and washed in a solvent bath for perfect cleansing.

Heavy self-aligning precision-type roller bearings are used on the mill's driveshaft. Helical gears mounted for opposing load thrusts provide a continuous gear contact which eliminates driving vibration.

S S S

Water Heaters Streamlined

Steamlining has been applied to the line of automatic storage water heaters made by the Lawson Mfg. Co., Pittsburgh. Considerable steel is used in their construction. The tank is either of copper or galvanized steel sheets. Top, base, legs, escutcheon plates and drain cock all are of steel. Pipe connections to the burner are of steel pipe.

Tennis Nets of Woven Stainless Steel Wire Free from Maintenance Cost

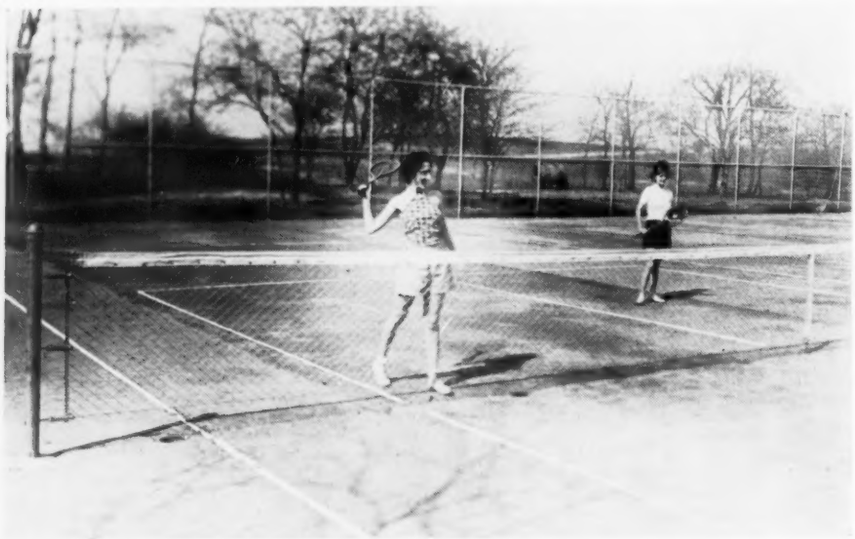
NEW and unusual use for stainless steel is its application in drawn wire form, woven into a chain link fabric for use as tennis nets. Twenty of such nets have already been installed in various municipal and private courts, including prominent installations in Chicago, White Plains, N. Y., Monessen, Pa., and other points.

High tensile strength plus marked resistance to all weather conditions and a minimizing of maintenance costs are claimed for this type of net. Once installed, the nets are permitted to stand permanently through all seasons of the year.

These units have been fabricated in 34-inch widths of 14-gage W. & M. stainless steel wire to a 1¾-inch mesh. In place, they are held under tension by two horizontal tension wires, one at the bottom of the net and one at the top. The top tension wire is later covered with a canvas hood. The entire net itself is fastened to pipe supports on each end by I-bolts with an adjustable leverage of 4 to 5 inches. Posts recommended for this type of installation are generally a 3-inch diameter galvanized steel pipe. The outside take-up bolts are adjustable only with a wrench. In place, including tension bars, I-bolts, canvas tape covering and all fittings, except the end posts, the entire net for a regulation tennis court does not weigh more than 45 pounds.

Stainless steel wire used in weaving this mesh has been generally the 18 per cent nickel and 8 per cent chromium analysis. Stainless steel for the net illustrated was supplied by Allegheny Steel Co., Brackenridge, Pa. The net was fabricated by Page Steel & Wire Co., Monessen, Pa. The wire is meshed according to common practice and the only welds employed are in connection with attaching the mesh to a No. 10 stainless steel wire rod used as the top horizontal tension bar.

Cost of one of these stainless installations is approximately $50 per unit, compared with a cord net installation of around $15 to $20 per unit. However, absence of maintenance costs, longer life and resistance to all weather conditions are advantages cited for the stainless installation.



No sagging or torn nets mar games on tennis courts provided with this type of woven stainless steel wire net. Cost is higher but maintenance is unnecessary

Racing Sloop Has 165-Foot Arc Welded Steel Mast

The 126-foot Boston sloop YANKEE, scheduled to invade British racing waters this summer, thrilled many a yacht racing enthusiast recently when she satisfactorily tested her new racing rig in a sail-stretching run off Neponset, Mass.

The sloop has a steel mast, first of its kind ever built in America. Made by Geo. Lawley & Sons Co., Neponset, Mass., it is entirely of arc welded nickel steel. Total length is 165 feet 7 inches, diameter 18 inches at the bottom tapering to 7 inches at the top. Thickness at the bottom is ⅜-inch, at the top ⅛-inch. Weight is approximately 5700 pounds, compared with 6200 pounds for the former wooden mast which carried the yacht's rigging in the 1934 America's cup trials.

The mast, which is hollow, was

SERVICE RECORDS *count most!*

In the choice of boiler tubes, nothing deserves more consideration than service records. What the tubes have done in the past under the most trying conditions of use, points quite definitely to the right selection. Experienced users of boiler tubes in the Railway, Marine, and Power Plant fields well know the long, satisfactory service given by NATIONAL Seamless Boiler Tubes. In specifying these tubes they know that they can count on the *highest degree of reliability*—they are not taking chances on either materials or methods.

The reasons for such proved performance, when well weighed, are convincing. First, and most important, a NATIONAL Seamless Boiler Tube has no weld—no long line of possible weakness. It is pierced from solid steel! And no other method yet devised, however ingeniously employed, can provide, with invariable certainty, the structural homogeneity of a solid forging. One continuous hollow cylinder, expanded and rolled at proper and definitely controlled temperatures to produce uniform grain refinement and uniform transverse and longitudinal strength —that's NATIONAL Seamless!

There are other reasons. See the list to the right. And NATIONAL Seamless Boiler Tubes comply, of course, with all recognized specifications—water-tube or fire-tube boilers. For strength, safety and economy, standardize on NATIONAL—

America's Preferred Boiler Tubes

NATIONAL TUBE COMPANY · Pittsburgh, Pa.

Pacific Coast Distributors—COLUMBIA STEEL CO., San Francisco, Calif.
Export Distributors—UNITED STATES STEEL PRODUCTS CO., New York, N. Y.

United States Steel Corporation Subsidiary

CHECK THESE REASONS WHY NATIONAL TUBES LAST LONGER

- √ Seamless—no uncertainty about full wall strength in every tube.
- √ Higher creep strength—only "killed" open hearth steel used.
- √ Uniform density and soundness—improved heat transfer characteristics.
- √ Exceptional ductility—readily manipulated—lowest installation costs.
- √ Dependable uniformity insured by careful metallurgical supervision.
- √ Thirty-five years' proved performance under exacting service.
- √ Comply with all recognized specifications—water-tube or fire-tube boilers.
- √ Product of America's largest manufacturer of seamless pipe and tubes.

NATIONAL SEAMLESS

BOILER TUBES—SAFE ENDS—SUPERHEATER TUBES—CONDENSER TUBING—ARCH TUBES—SUPERHEATER PIPES—STAY-BOLT MATERIAL

built in four sections. Each section was made from a single sheet of steel, rolled to cylindrical shape with edges butted together and welded the entire length. When all four sections were completed they were welded together with a steel ring at the joint. All stays and other rigging fixtures were then welded in proper position on the mast. The 450 feet of welding required on the mast was done with a special electrode manufactured by the Lincoln Electric Co., Cleveland.

Magnetic Testing Equipment Assures Uniformity of Steel Bearing Balls

ADDED uniformity in ball bearing manufacture has been made possible recently by a unique electrical testing unit which reveals internal defects and gives an indication of the microstructure of the steel without injury to the surface of the ball itself. The equipment, shown in the accompanying illustration, is in operation at the plant of the Fafnir Bearing Co., New Britain, Conn., for whom it was developed.

Balls to be tested are simply rotated on two small electrical contacts in the V-shaped notch in front of the operator, and a light beam moving over a ground-glass scale reveals whether or not they come within previously determined standards.

A balance of inductances between three known values and the ball to be tested, similar in principle to the balance of resistances obtained with a Wheatstone bridge, provides the basis of the test. Since the balls have been checked previously for size to within limits of 0.00005 to 0.0001-inch, settings are made on the basis of constant mass for each size of ball.

Experiments have shown that internal flaws, soft centers, excessive decarburization and other variations in microstructure all result in definite changes in the readings obtained. Since hardness also depends upon microstructure, the measurement gives an indirect check on this factor as well. Correlation of the results obtained with metallographic examination, hardness tests, and the like, provides standards for production tests.

At present, all balls of 1-inch diameter and larger, where variations due to heat treatment are more likely to occur, are tested on this equipment. Smaller sizes may also be tested.

Defects in steel bearing balls are detected speedily in this magnetic testing device. The balls, one at a time, are rotated on two electrical contacts in the V-notch in front of the operator; a light beam on a scale reveals whether the ball is within prescribed standards

Joint Committee Proposes Plain Washer Standards

A proposed American standard for plain washers for use with American standard regular bolt heads and nuts has recently been completed by subcommittee No. 1 of the sectional committee on the standardization of plain and lock washers. This proposed standard now is being distributed to industry for criticism and comment. Copies will be made available upon application to C. B. LePage, secretary, American Society of Mechanical Engineers, 29 West Thirty-ninth street, New York.

The standardization of plain washers is one of the projects assigned to the sectional committee on the standardization of plain and lock washers, of which C. W. Squier is chairman. This committee was organized under the procedure of the American Standards association in 1925 with the Society of Automotive Engineers and the American Society of Mechanical Engineers as joint sponsors.

Presents Properties of Refractory Materials

Technical bulletin No. 57, just issued by the American Refractories institute, Pittsburgh, presents the properties of refractory materials not including fireclays. A table compiled by S. M. Phelps, senior industrial fellow, refractories fellowship, Mellon Institute of Industrial Research, Pittsburgh, lists 17 materials and gives the following information concerning each: Composition of the pure material, including formula and constituents in per cent; melting point; true specific gravity; hardness Mohr's scale; mean specific heat; and mean reversible thermal expansion.

Publishes Second Progress Report on Steel Wind Bents

The second progress report and general summary of tests and design of steel wind bents, made at the engineering experiment station of Ohio State university, Columbus, O., in cooperation with the American Institute of Steel Construction, New York, has just been published.

The phase of wind stress investigation now in progress was begun late in 1933 with the design and construction of a steel model of the lower 13 stories of a 55-story 3-panel wind bent. The Spurr method of design was used and the model was reduced to 1/24 size in accordance with the principles of similitude. The full wind loading was simulated by dead weights and applied by a specially-designed rigging.

During the summer of 1934, test data were taken upon the model in its original form. The data included stresses found, deflection measurements and observed joint rotations. A discussion of the results, including comparisons with theoretical values, was published by the American Insti-

tute of Steel Construction in November, 1934, in a progress report "Tests of a Steel Model of a 55-Story Wind Bent."

The second progress report, also published by the institute, includes corresponding test data taken upon the model after a tall basement story had been created and, later, a 2-story entrance. Parallel theoretical analyses made by the slope deflection method have been quite useful in studies made of these data and in formulating the design procedures recommended for these two types of irregularities.

Presents Information on High-Temperature Cement

The Ironton Fire Brick Co., Ironton, O., has issued information circular No. 3 dealing with its Ironton bond high-temperature cement. The circular contains the chemical and physical properties of the material and reports on tests conducted under direction of the refractories fellowship at Mellon Institute of Industrial Research, Pittsburgh.

The circular also contains instructions on preparation of the cement for use and how to utilize it for laying up and coating fire clay brickwork. A list of 30 applications is appended. The cement is made from quartz, which is practicaly pure silica, sintered kaolin, a high-grade bond clay and a small percentage of ceramic bond. It gives a cold set bond and withstands extreme temperatures. When batter made from it dries out in the mortar box, it can be restored to original condition by addition of water.

Seamless Tube Manufacture Has New Presentation

Manufacture of Seamless Tubes, by Gilbert Evans; cloth, 187 pages, 7¾ x 10 inches, 129 illustrations; published by Sherwood Press, Cleveland; supplied by STEEL, Cleveland, for $12, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

The author formerly was manager of the Mannesmann Tube Co. Ltd., thus having a complete background for his work. This is the first book on the manufacture of seamless metal tubes since 1903. It contains completely illustrated descriptions of practically every process by which seamless tubes are manufactured. Data are given to aid the producer in choosing the process best suited to particular conditions, whether ferrous or nonferrous.

Attention also is given to warehousing, tools, testing, inspection and general organization of tube plants, making the volume valuable to practical operators, metallurgists and others.

WELDING, et cetera . . .

BY ROBERT E. KINKEAD

IN THIS column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

Sound Investment

THERE is more strip mill capacity in the steel industry than is needed. Still more capacity is being installed. The public is amazed at this outlay of private capital for machinery. There are three sound reasons for such an investment:

(1) The new strip mills are enormously efficient; (2) the trend is toward high consumption of strip steel in the equipment of homes, factories, ships, and transportation apparatus in general; and (3) modern methods of fabricating strip steel, of which welding is the most important, have made the use of strip steel economical in place of wood and other materials of construction.

It is further an established fact in the steel industry, and in private industries in general, that capacity to produce always leads consumption.

Promising Engineer

A young mechanical engineer we know just graduated from Case School of Applied Science. He earned part of his expenses by work in drafting rooms. Now, he proposes to go to the Boeing United Airlines aircraft design school in Oakland, Calif., this fall. He will do drafting on the side to help pay expenses there. He reasons that scouts from big industrial companies who are offering graduates $75 per month with possibility of becoming "executives" within 25 years and earning $250 per month are trying to sell a bill of goods. These kids are not so easy to fool as they used to be.

Rossell Writes a Book

It takes courage to write a book on welding. It is always possible that it will be obsolete before the publisher gets it printed. Commander H. E. Rossell, (CC) USN, professor of naval construction at Massachusetts Institute of Technology, recognized this difficulty in his introduction by saying that references to arc welding practice were necessarily tentative. But the book, *Riveting and Arc Welding in Ship Construction*, is practical and sufficiently specific to be of use to anyone who deals with the welding of light plate and structural shapes.

Welding in naval construction at the present time is the largest job of arc welding ever carried out anywhere. Commander Rossell gives proper and due credit to officers of the navy and to Leon Bibber who have made this great program a success. There is at least $500,000,000 worth of experience behind this book. No welding man should be without it.

Sparks and Flashes

On the Cleveland sewage disposal plant, a welding operator put down 60 feet of ¼-inch fillet weld per hour for five consecutive hours. This is a PWA project, but this man is a member of a welding firm which has the welding subcontract. He must have been actuated by some base motive such as hope for profit.

♦ ♦ ♦

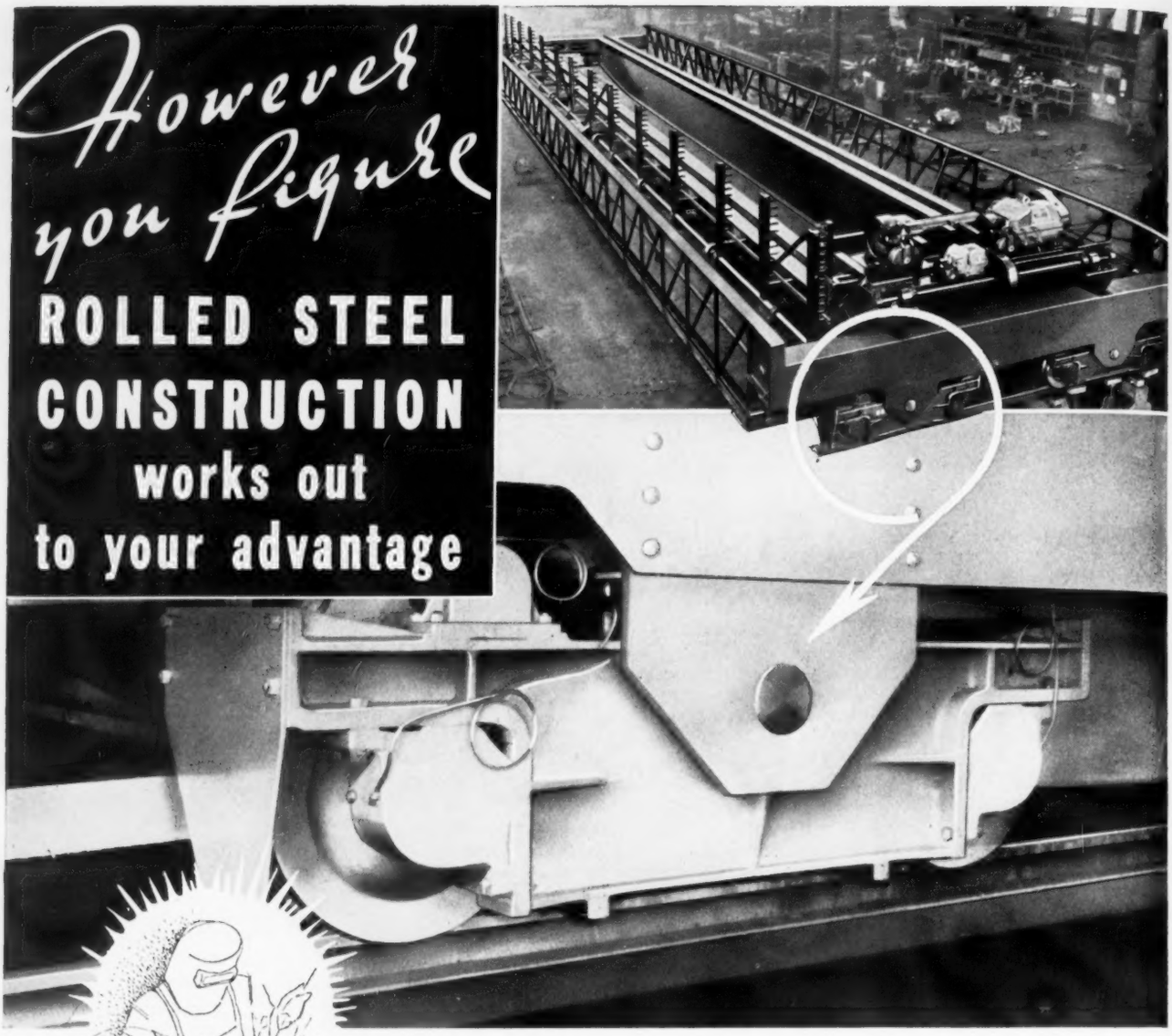
We deal with management executives and with welding operators. It seems to us that sound judgment is entirely independent of the job a man does. Each could do the other's job if he had the other's background of experience and information.

♦ ♦ ♦

The beginning of high man-hour productivity in welding was made when stop-watch studies were made of the operation. Now, continuous automatic stop-watches keep costs under control.

However you figure

ROLLED STEEL CONSTRUCTION works out to your advantage



Where equipment must be safe, you can rely on rolled steel construction. Here, for example, is a crane, every pound of which is rolled steel . . . The definitely known strength of this material gives absolute assurance that the completed equipment will be adequate for its purpose . . . which is one important reason for the tremendous strides rolled steel is making in machine construction. + Add to this quicker production, particularly of new and unstandardized parts. + Add also the low inventory required. A small stock of steel can be fashioned into a great variety of parts. — Eliminate excess weight. — Eliminate preparatory expense. — Eliminate delays. No waiting for parts. + Rolled steel permits changes in design at little or no expense. + Consider modernized appearance as a sales factor. = Summed up, Rolled Steel works out to your advantage whether you are a buyer or manufacturer of machinery.

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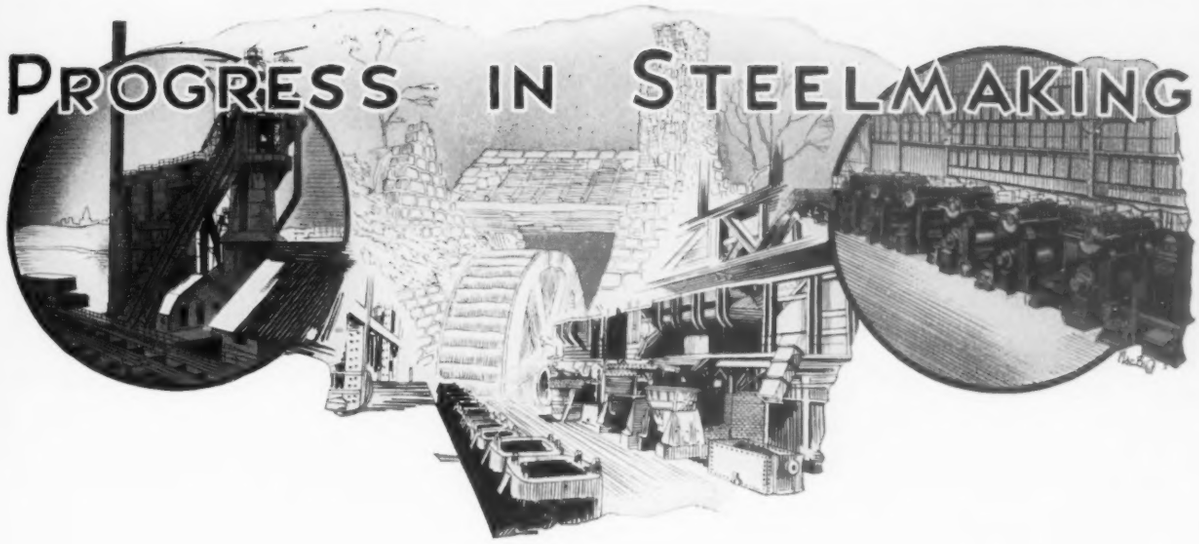
CARNEGIE STEEL COMPANY • PITTSBURGH

Rolled Structural Sections also produced by

ILLINOIS STEEL COMPANY • CHICAGO
COLUMBIA STEEL COMPANY • SAN FRANCISCO
TENNESSEE COAL, IRON and RAILROAD COMPANY • BIRMINGHAM

United States Steel Corporation Subsidiaries



Keyways Affect Alignment

Tests at a steel plant in the Pittsburgh district disclose that cold drawn shafting frequently is thrown out of alignmment if keyways are cut at or near the center of the shaft. This may escape notice at the time of installation but later may result in considerable damage to equipment. The use of cold drawn shafting at this plant, therefore, is confined to equipment not subject to high stress and not requiring keyways other than at the ends of the shaft. A study of shafting failures at this plant is made by its metallurgical department which not only recommends the proper shafting specifications and heat treatment for a particular application but through a follow-up system maintains a complete record of its performance.

• • •

Resists Action of Slag

In many boiler furnaces the greatest contributing factor to the destruction of the brick setting is fluxing by corrosive slags from the ash of the fuel. The excellent resistance of high-alumina brick to the chemical action of fuel ash of high basic oxide content accounts for their successful applications in such boiler settings.

• • •

Process Clarifies Waste

Clarification of coke plant still waste now is accomplished by a recently devised process. The successful elimination of phenols from the still waste, it is claimed, has been possible through the selective affinity of "Muchar" (activated carbon) which attracts only phenol and allied color forming materials. Still waste process charge against the coke plant is said to amount to only a few cents per ton of coal charged.

• • •

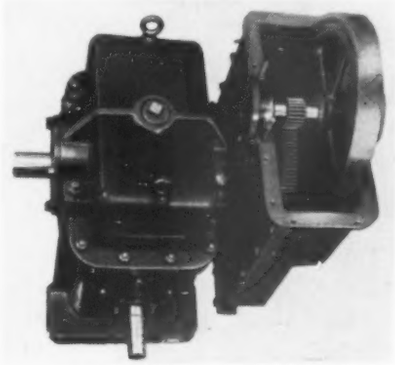
New Goggle Is Nonfogging

Effective ventilation and protection from splashes of dangerous liquids and the impact of flying particles feature a newly marketed goggle. Eye cups fit snugly to the contour of the face and prevent liquids from entering around the goggles. Air circulates through slots in the lens rings through the radial slots in the eyecups and through the perforated side shields. A solid baffle plate back of the side shield is flared out on the edge nearest the lens, permitting air circulation but isolating the eyes from splashes. An adjustable rubber covered ball chain bridge is provided. Workers can wear the goggle all day in comfort and without any fogging of the lenses, it is stated. Ventilation keeps the eyes cool and lenses clear even under humid working conditions. The new goggle is highly suitable for pickling department operators.

• • •

Reduces Shutdowns

Operating and maintenance costs have been reduced at the plant of a wire-maker by the installation of an inertia governor speed reducer on the takeup frame of a wire galvanizing unit. The mechanism includes a flywheel which materially assists in regulating the speed of the reducer under all conditions. The flywheel rotates in the opposite direction to the worm wheel, thus insuring uniform wear on the teeth of the worm and gear and prolonging their campaign. The governor in starting creates a flywheel effect thus producing smooth acceleration. In decelerating, the flywheel effect is dissipated producing smooth deceleration. The unit, shown in the accompanying illustration, is made by the Elevator Mfg. Co. of America, Chicago



Reactions Are Favorable

Low-manganese bessemer iron affords better ladle reactions, better slags and more uniform results in general, according to study made in the Pittsburgh district involving about 100,000 tons of bessemer billets. The critical point in blowing bessemer iron, the point where the slag becomes watery and sloppy, is encountered when the manganese content of the metal surpasses 0.50 per cent. When this is the case rejections increase from 8 to 10 per cent.

• • •

Markets New Electrode

New hard facing electrodes for building up carbon, low-alloy or high-manganese steel surfaces to resist abrasion have been placed on the market. The deposit, which is self-hardening, is suitable for gear and pinion teeth; lips, teeth and bottoms of power shovels, etc.

IMPROVING OPEN-HEARTH FURNACE DESIGN

by William C. Buell Jr.

Chapter III **Part I**

Fantails

FANTAILS or necks are the short flues that connect the slag pockets and regenerator chambers. While structurally the fantails are relatively simple members of the furnace system, through the included development of areas A_{10}, the effluent outlets of the slag pockets, and areas A_{11}, the inlets of the regenerators, they become important members of the flow system. The lesser of the areas, A_{10} and A_{11}, are highly critical to the resulting gas flow in the regenerator chambers, and are ranked as the third most important areas of the furnace design, being exceeded in this respect only by areas A_8 and A_2.

Actually, areas A_{10} are a part of the slag pockets and A_{11} of the regenerator chambers but in order that these two areas may be discussed connectedly they are taken as factors of fantail design.

Factors Are Interrelated

Still another factor, which is not really a factor of fantail design but actually one of slag pocket-regenerator layout, is considered as of the fantails. This is the offset of the center line of the regenerators with reference to the center line of the appropriate slag pocket, and which taken in conjunction with the length of the fantails develops their angularity.

By the time the effluent furnace gases have reached the fantails their temperatures have fallen appreciably from those as entering the downtakes, and consequently refractory maintenance nearly ceases to become

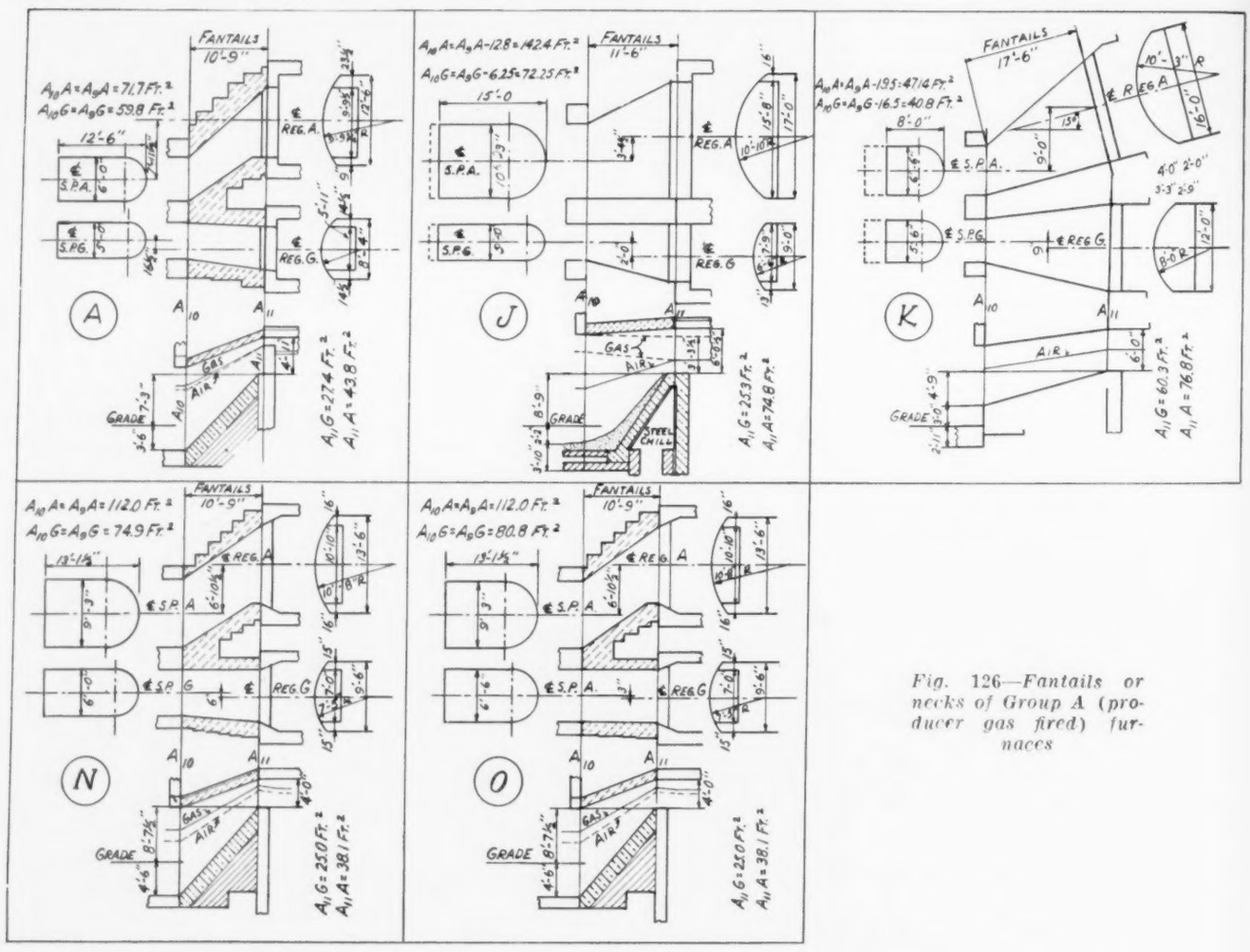
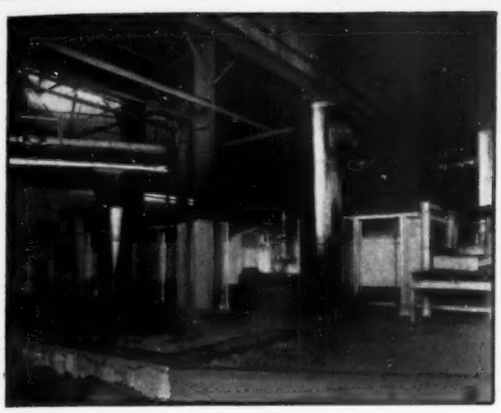


Fig. 126—Fantails or necks of Group A (producer gas fired) furnaces

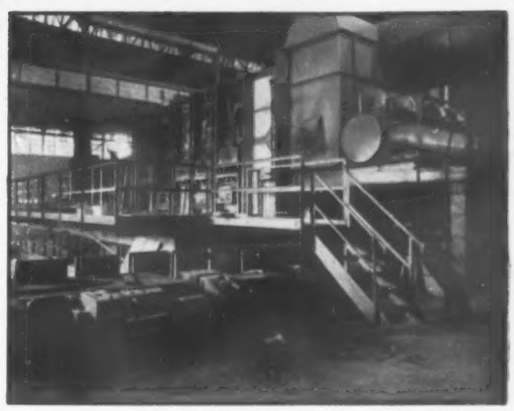
Efficient Heating

Heat Treating or Normalizing Furnace furnished by the Wean Engineering Co., designed and built by Flinn & Dreffein Company.

Raw Producer Gas Burner Application to Flinn & Dreffein "Radiant Gap" Continuous Pack Furnace.



Flinn & Dreffein Producer Gas Laboratory Type Continuous Billet Heating Furnaces.



3 Features in the Operation and Design of the Flinn & Dreffein Continuous Heat Treating Furnace, shown in the illustration above.

1. Ruggedness of Construction Minimum use of alloy. Operates at higher temperatures than other furnaces.
2. Superior design of heat distribution permits the use of a single burner for each zone. The simplicity of this design as compared to furnaces having a multiplicity of burners enables the operator to accurately adjust both temperature and atmosphere.
3. In the Flinn & Dreffein "Radiant Gap" Type Furnace, destructive and prohibitive temperatures in the combustion chambers are impossible. This feature prolongs the life of the furnace structure.

FOR more than a quarter of a century, the Flinn & Dreffein Company, of Chicago, have been recognized as producers of the most efficient heating plants used by the Steel Industry.

The above illustrations show a few of the many installations in plants now using Raw Producer Gas, Natural Gas, Coke Oven Gas, or Oil, for the successful heating of slabs, billets, bars, and sheets.

FLINN & DREFFEIN COMPANY

CHICAGO, ILLINOIS.

Associate Company. The WEAN ENGINEERING CO., Inc.

Warren, Ohio

a factor of upkeep costs. On account of the lower gas temperature the substitution of fire brick for the silica brick generally begins to take place and is usually complete at the beginning of the regenerator chambers.

The critical areas, the layout and refractory details of the fantails of the typical furnaces are illustrated in Figs. 126 to 129, inclusive.

Have Common Center Wall

The first general point of the illustrations to be noted is that the fantails of furnaces J, P, D, H and M have a common center wall separating the air and gas ducts while all others are separated towards the extended or regenerator end. The regenerator chambers of the specified furnaces, likewise, have a common center wall which is the governing influence of the center wall design of the fantails.

The length of the fantail is taken as the distance between the inner planes of areas A_{10} and A_{11}. Area A_{10} is the opening from the slag pocket and A_{11} the maximum effective area at the entrance of the regenerator chambers, usually in the plane of the outer surface of the regenerator end walls. In the illustration the areas A_{10} are developed by the full outlines at the left of each fantail plan section. The dotted outline in conjunction with the full lines as for instance furnaces K or B, shows the slag pocket area development at A_5 (see Fig. 108).

Table XCIX

The Horizontal Angularity of Fantails

Fan-Tail	Off-Set/Length	= tan.	= Angle	Relative Design Order
A	95.5/129	0.74	35°-30′	Poor
J	40.5/138	0.293	16°-20′	Very good
K	108/210	0.514	27°-12′	Good
N & O	82.5/129	0.64	32°-37′	Fair
I	58.25/120	0.485	25°-52′	Good
P	70.5/108	0.651	33°-4″	Fair
G	77.25/87	0.938	43°-10′	Very poor
L	86.5/133.5	0.648	32°-56′	Fair
B	115.5/141.5	0.816	39°-13′	Poor
D	61/112.5	0.542	28°-27′	Good
E	80.5/117	0.688	34°-32′	Fair
H	60/82.5	0.727	36°-1′	Poor
F	83.5/105	0.795	38°-29′	Poor
M	100/112.5	0.889	41°-38′	Very poor

Areas Are Depicted

The effective regenerator entrance area, A_{11}, is shown at the right and the outline of the regenerator chamber at the top and sides indicated. A vertical sectional elevation, taken through the gas fantail is shown below the plan. The detailed figures of the size of the various critical areas are included with the illustrations.

The full or nearly full area of the slag pocket if available at A_{10} has little effect on flow, for as explained in the prior chapter, the increasing slag accumulation during the course of a campaign is raising continually to reduce this. While with this area developed to the full height of the slag pocket some little volume in the fantails becomes available for the storage of slag, as in all of the fantails of Figs. 126, 127 and 128, excepting that of furnace K, it is thought that the extremely sharp upward slope of the fantail bottoms into the regenerators inherent with this design will cause the effluent gases to "kick" upwards unduly and thus cut the regenerator roofs near the entrances. The much better designs of the fantails in this respect, furnaces B, H and F, Fig. 129, should be noted particularly.

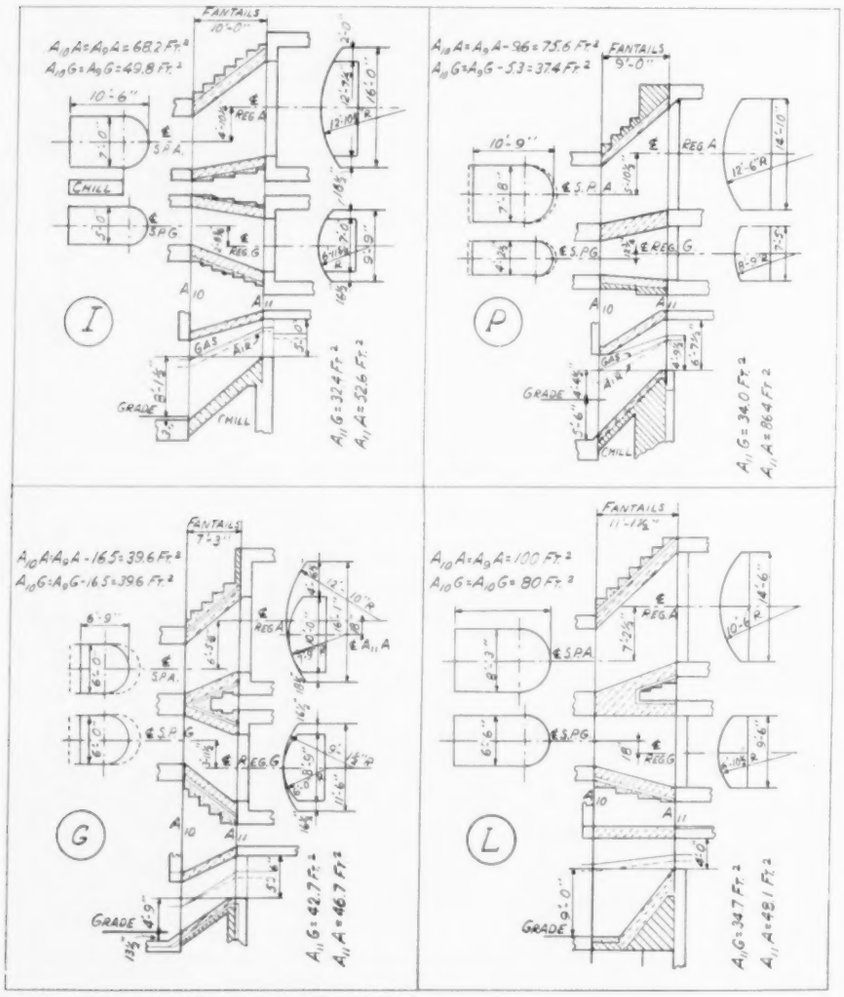


Fig. 127 (Above)—Fantails of Group B furnaces. Fig. 128 (Below)—Fantails of Group C (mixed gas fired) furnaces

How Angularity Is Determined

The mean angularity of the fantails in plan is considered as the tangent of the offset of the center lines of the slag pockets and regenerators divided by the noted length of the fantails. It actually may not be as great as ascribed because of an underdeveloped width of the fantails at the regerator entrance A_{11}. This condition may be observed in exaggerated form in the air fantails of furnaces G, D and H.

Excessive angularity in the fantail plan will tend to cause the effluent gases to flow towards and impinge on a regenerator wall, thus severely affecting the distribution of the gases to the checker flues. This effect will be accentuated greatly if the area A_{11} is so small as to develop excessive velocity. The subject of the distribution of the gases within the regenerator chambers will receive detailed treatment in the following chapter.

The details of the angularity of

Table C

Areas A_{10} and A_{11} as Found at Fantails of Typical Furnaces

Fantail	Area in Square Feet at $A_{10}A$	$A_{10}G$	A_{10}	$A_{11}A$	$A_{11}G$	A_{11}
A	71.7	59.8		**43.8**	**27.4**	
J	142.4	72.3		**74.8**	**25.3**	
K	**47.2**	**40.8**		76.8	60.3	
N	112.0	74.9		**38.1**	**25.0**	
O	112.0	80.8		**38.1**	**25.0**	
I	68.2	49.8		**52.6**	**32.4**	
P	**75.6**	37.4		84.6	**34.0**	
G	**39.6**	**39.6**	79.2	46.7	42.7	89.4
L	100.0	80.0		**48.1**	**34.7**	
B	49.0	36.6	85.6	45.8	27.4	**71.2**
D	26.8	26.8	**53.6**	41.8	30.3	72.1
E	47.5	37.6	85.1	29.8	24.8	**54.6**
H	37.8	37.8	75.6	39.2	26.5	**65.7**
F	45.5	32.3	**77.8**	58.0	29.8	87.8
M	45.0	22.5	**67.5**	55.0	27.0	82.0

Note: Figures in bold face type are the smaller and controlling areas.

the fantails in plan for the most acute condition, which is the air duct in all cases excepting furnace M, is given in Table XCIX. Many factors affect the angularity of the fantails especially the overall widths of the slag pockets and regenerator chambers as well as the length available for the fantails, but these factors are all influenced to a great degree by the limitation of building layout. With ample space available the attractive plan layout of slag pockets, fantails and regenerator chambers such as seen in furnace J is possible. As with cramped floor areas, the poor arrangements of these components, furnace G and D, likely are mandatory, which once again indicates the futility of subordinating the design of an open-hearth furnaces to the layout of a building.

Examination of the areas A_{11} (or A_{10} should it be the lesser), with particular reference to the velocity of the gas flow therethrough discloses that the fundamental of design involved in these highly critical areas is to cause the effluent gases to enter the regenerator chamber under such low velocity and effective distribution that they will flow as a horizontal curtain or film over the top surface of the checkerwork. Here they encounter the effects of the subatmospheric pressure of the voiding arrangement, which will be slight on account of the considerable flue area through the checkerwork, and flow evenly into all the checker flues, thus causing the entire volume of checker work to become effective as a heat transfer medium. Such an ideal condition never can be achieved fully although it may be approached. However, most of the typical furnaces show an utter disregard of this important design factor.

The areas at A_{10} and A_{11} disclosed in the typical furnaces are listed in Table C, with the more critical emphasized.

(To be continued)

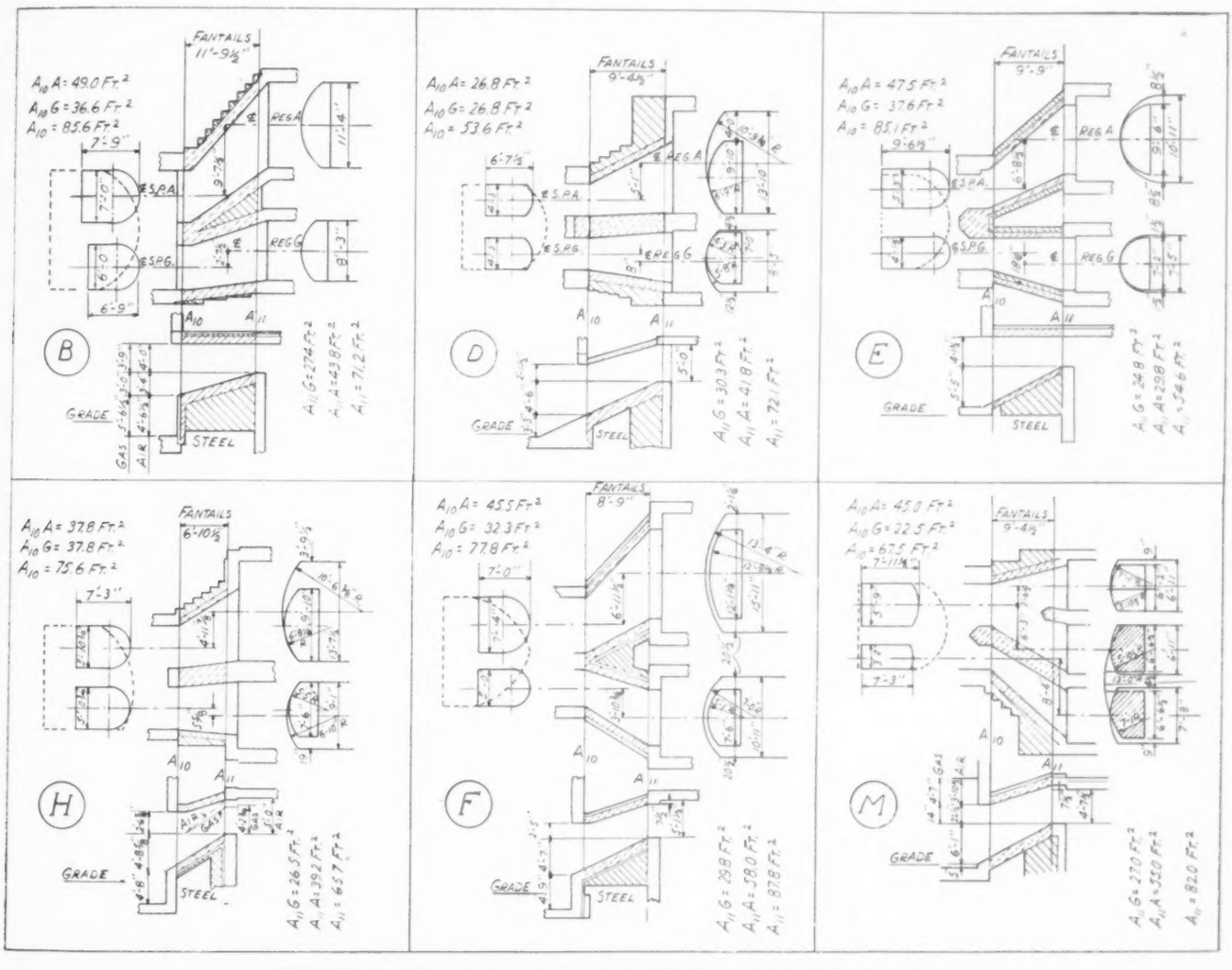


Fig. 129—Faintails or necks of Group D (fixed fuel fired) furnaces

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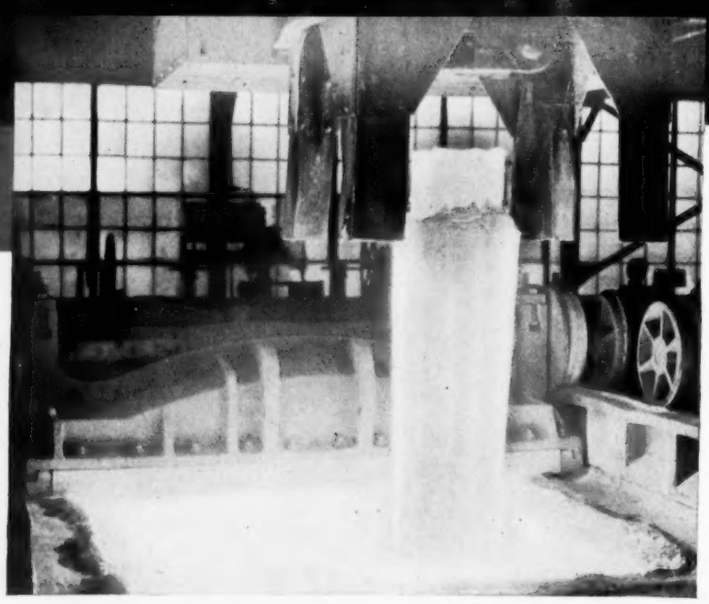

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Corrosion Work Reviewed by Testing Materials Society

CORROSION of metals, effect of temperature on metals, fatigue of metals, spectrographic analysis, metallography, and nonferrous metals, were subjects discussed at closing sessions of the thirty-eighth annual meeting of the American Society for Testing Materials held in Detroit, June 24-28. Sessions conducted early in the week were reported in the July 1 issue of STEEL.

Constituting a hazard in the life of ferrous as well as ferrous metals, corrosion formed the main theme of one session. Numerous committees of the society, making this subject the object of intensive investigation and planning accelerated procedure for forecasting ultimate results, have developed means for measuring and evaluating results.

Reporting for committee A-10 on iron-chromium, iron-chromium-nickel and related alloys, Jerome Strauss, chief research engineer, Vanadium Corp. of America, Bridgeville, Pa., chairman, recommended tentative specifications for sheets, strip and plates of chromium-nickel steels and for three classes of chromium steel castings, containing 12, 19 and 28 per cent, respectively, of the controlling alloy. All of these latter specifications provide that the steel shall be made in the electric furnace.

Three new specifications covering electrodeposited coatings of zinc, cadmium, and nickel and chromium on steel were proposed in the report of committee A-5 presented by Chairman F. F. Farnsworth, outside plant engineering, Bell Telephone Laboratories Inc., New York. These provide standards for time and current density. Revisions were offered for specifications for steel farm-field and railway right-of-way wire and for barbed wire.

Water Flow Corrosion Test

A continuous flow corrosion test method for steel pipe was described in a paper by H. S. Rawdon and L. J. Waldron, chief, division of metallurgy, and assistant metallurgist, respectively, national bureau of standards, Washington. This involves the use of small 2-inch sections of open-hearth steel pipe, forming part of a system through which water is circulated. Producers of pipe, represented in the discussion, suggested that the test failed to provide the conditions of practical service with wide variations in pressure and temperature conditions.

Air conditioning equipment, a recent commercial development, has brought problems relating to corrosion in materials used, according to a paper by C. M. Sterne, chief engineer, Metropolitan Refining Co. Inc., Long Island City, N. Y. Attack upon metallic parts of this equipment has been found in some cases to destroy pipes and sheets within as short a period as four months. A series of tests on more than 200 air conditions systems, both of the comfort type and the industrial conditioning equipment, show that by proper chemical treatment of the circulating and cooling medium and supervision the attacks may be reduced. Sodium dichromate is said to give the best protection and also serves to remove organic odors from the wash water of air conditioning systems.

Correlates Tests with Service

A paper by H. E. Searle, manager, sales research, and F. L. LaQue, development and research department, International Nickel Co., New York, presented by the latter, showed the results of field corrosion tests employing a spool type of specimen holder carrying various types of materials. Comparison was made between the method outlined and standard practical conditions, notably in the case of cast filter support guides used in dewatering and drying salt. Here nickel alloyed and unalloyed cast iron specimens and the standard grids showed a similar result, with the former giving only one-twelfth the corrosion effect of the latter.

Report of the joint research committee on the effect of temperature on the properties of metals, of which H. J. French development and research department, International Nickel Co. Inc., New York, is chairman, was presented by Prof. A. E. White, director of department of engineering research, University of Michigan, Ann Arbor, Mich., and it outlined the progress that had been made since the last meeting. It stated that samples of 0.40 per cent carbon steel were being distributed to 10 or more laboratories for high temperature tension tests. An appendix to the report pointed out that cast and wrought 18 per cent chromium, 8 per cent nickel steel shows a moderate loss of impact resistance after heating 100 hours at 1400 degrees Fahr., and only minor changes in impact resistance with further heating up to 3870 hours. A satisfactory impact resistance remained after 3870 hours heating at 1400 degrees Fahr.

John W. Bolton, chief chemist and metallurgist, Lunkenheimer Co., Cincinnati, described some tests on tin bronzes containing, respectively, about 88 per cent copper, 10 per cent tin, and 2 per cent zinc; and 88 per cent copper, 6 per cent tin, 4 per cent zinc, and 2 per cent lead. He stated that in his opinion the latter alloy was suitable for use at 500 degrees Fahr., and possibly 550 degrees; at 500 degrees the design stress should be limited to 5000 pounds per square inch. In the case of the 88-10-2 alloy, the load carrying ability at 500 degrees Fahr. is lower than for the other alloy, and there is a distinct evidence of embrittlement.

Discussion of the paper was presented by Prof. White; H. W. Maack, chief chemist and metallurgist, Crane Co., Chicago, who stated that work he conducted agreed with Mr. Bolton's; E. R. Darby, metallurgist, Federal-Mogul Corp., Detroit, who inquired what results might be expected if completely stabilized alloys had been used; and Robert Job, vice president, Milton Hersey Co. Ltd., Montreal, Que. T. H. Kilgrehn, Internationl Nickel Co., New York, submitted a written discussion.

Results obtained from extended time creep tests on plain carbon steel and chromium - silicon - molybdenum steel conducted by A. E. White and C. L. Clark, director and research engineer, respectively, department of engineering research, University of Michigan, Ann Arbor, Mich., and R. L. Wilson, metallurgical engineer, Timken Steel & Tube Co., Canton, O., were described by Mr. Clark. They indicate that creep rates are influenced by the length of time they are extended.

Comments on this paper were given by H. F. Moore, professor of engineering materials, University of Illinois, Urbana, Ill.; John W. Bolton; Don W. McCutcheon, Ford Motor Co., Detroit; and E. L. Robinson, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Aircraft Engine Materials Studied

R. R. Kennedy, associate metallurgist, U. S. army air corps, Wright Field, Dayton, O., discussed creep characteristics of nine aluminum alloys used in aircraft engine construction. Temperatures of 400 and 600 degrees Fahr. were used as they were in the usual operating range. Sand cast aluminum-copper-nickel-magnesium alloy had the best creep characteristics, but other new cast and wrought alloys are found serviceable because they have better casting and forging properties.

Report of the research committee on fatigue of metals was presented by Prof. H. F. Moore, chairman, and it included notes on fatigue tests on rotating beam testing machines.

A rotating-wire arc fatigue machine for testing small diameter wire was described by J. N. Kenyon, testing engineer, civil engineering testing laboratories, Columbia university, New

York, and a paper on high-speed fatigue tests of several ferrous and nonferrous metals at low temperatures was presented, by W. D. Boone and H. B. Wishart, special research assistants, materials testing laboratory, University of Illinois, Urbana, Ill. Results obtained by the latter authors showed an increase in endurance limit as the temperature decreased from plus 80 degrees Fahr. to minus 50 degrees.

Symposium on the Spectrograph

Following the report of committee E-2 on spectrographic analysis of which H. V. Churchill, Aluminum Co. of America, New Kensington, Pa., is chairman, a symposium on spectrographic analysis was held. The symposium included six papers relating to application of the spectrograph to ferrous and nonferrous metals and alloys. The first by W. R. Brode, Ohio State university, Columbus, O., described spectrographic analysis of steel samples. H. E. Stauss, Baker & Co. Inc., Newark, N. J., spoke on the use of the spectrograph in the platinum industry while J. S. Owens, Dow Chemical Co., Midland, Mich., gave information on quantitative spectrographic analysis of magnesium alloys for manganese and silicon.

Procedure for determining impurities in commercial cadmium by the spectrograph was described by Miss Frances W. Lamb, Bohn Aluminum & Brass Corp., Detroit. M. L. Fuller, New Jersey Zinc Co., Maurer, N. J., talked on the purification of graphite electrodes for spectrochemical use, and the final paper was by R. A. Wolfe, University of Michigan, Ann Arbor, Mich., on quantitative analysis of nonferrous alloys by spectrographic analysis.

Discussions following the various papers brought out the fact that the spectrograph in many instances forms an extremely useful instrument for rapid, accurate, quantitative determination of various elements in ferrous and nonferrous metals and alloys. To a great degree use of the spectrograph is being less and less confined to ministrations of experts so that it may be used by the average intelligent laboratory assistant for routine analysis With former study and developments in procedure, it is expected that the spectrograph will find wider application for rapid, quantitative analysis.

Session on Nonferrous Metals

A closing session was devoted to the metallography of nonferrous metals, and was presided over by H. A. Anderson, metallurgical engineer, Western Electric Co. Inc., Chicago. Report of committee B-1 on copper wire, presented by Chairman J. A. Capp, General Electric Co., Schenectady, N. Y., included proposed tentative specifications for bare, stranded copper cable; hard, medium-hard and soft, and proposed tentative specifications for bronze trolley wire, which were recommended for publication by the society.

Dean Harvey, purchasing engineer, material and material process engineering department, as chairman, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., presented the report of committee B-4 on electrical heating, electrical resistance and electric furnace alloys while that of committee B-5 on cast and wrought copper and copper alloys, of which C. H. Mathewson, professor of metallurgy, Yale University, New Haven, Conn., is chairman, was presented by W. B. Price, chief chemist and metallurgist, Scovill Mfg. Co., Waterbury, Conn. That report contained three proposed tentative specifications relating to copper-silicon alloy wire for general purposes; wrought phosphor bronze bearings and expansion plates for bridges and structures, and wrought silicon bronze bearings and expansion plates for bridges and structures, which were recommended for publication. However, after a discussion by C. H. Davis, assistant metallurgist, American Brass Co., Waterbury, Conn., who pointed out that sufficient data was not available at the time the specification on wrought silicon bronze bearings and plates was prepared, that specification was withdrawn.

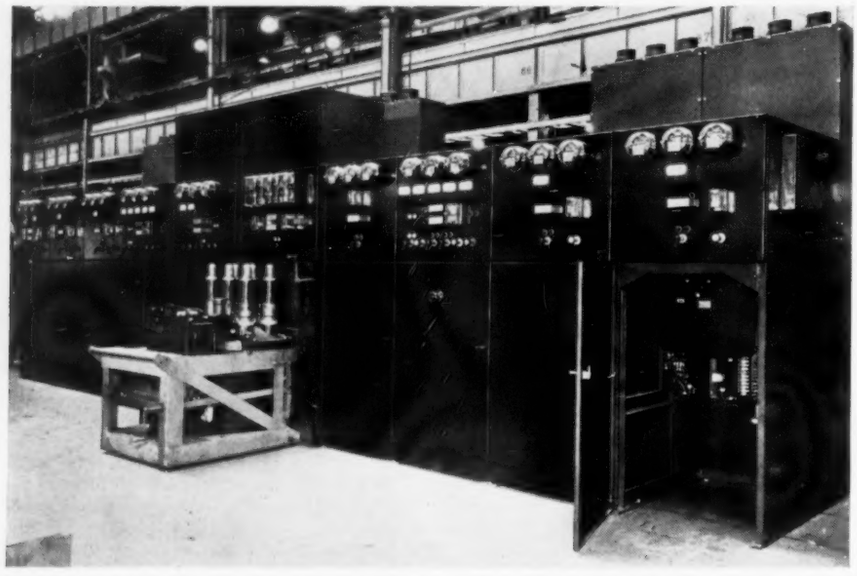
Practice for Metallography

Report of committee E-4 on metallography was presented by chairman C. H. Davis, and he called attention to a proposed tentative recommended practice for metallographic testing of ferrous and nonferrous metals which was included. That practice recommendation is an extensive and complete work covering all phases and comprises about 33 pages including a bibliography.

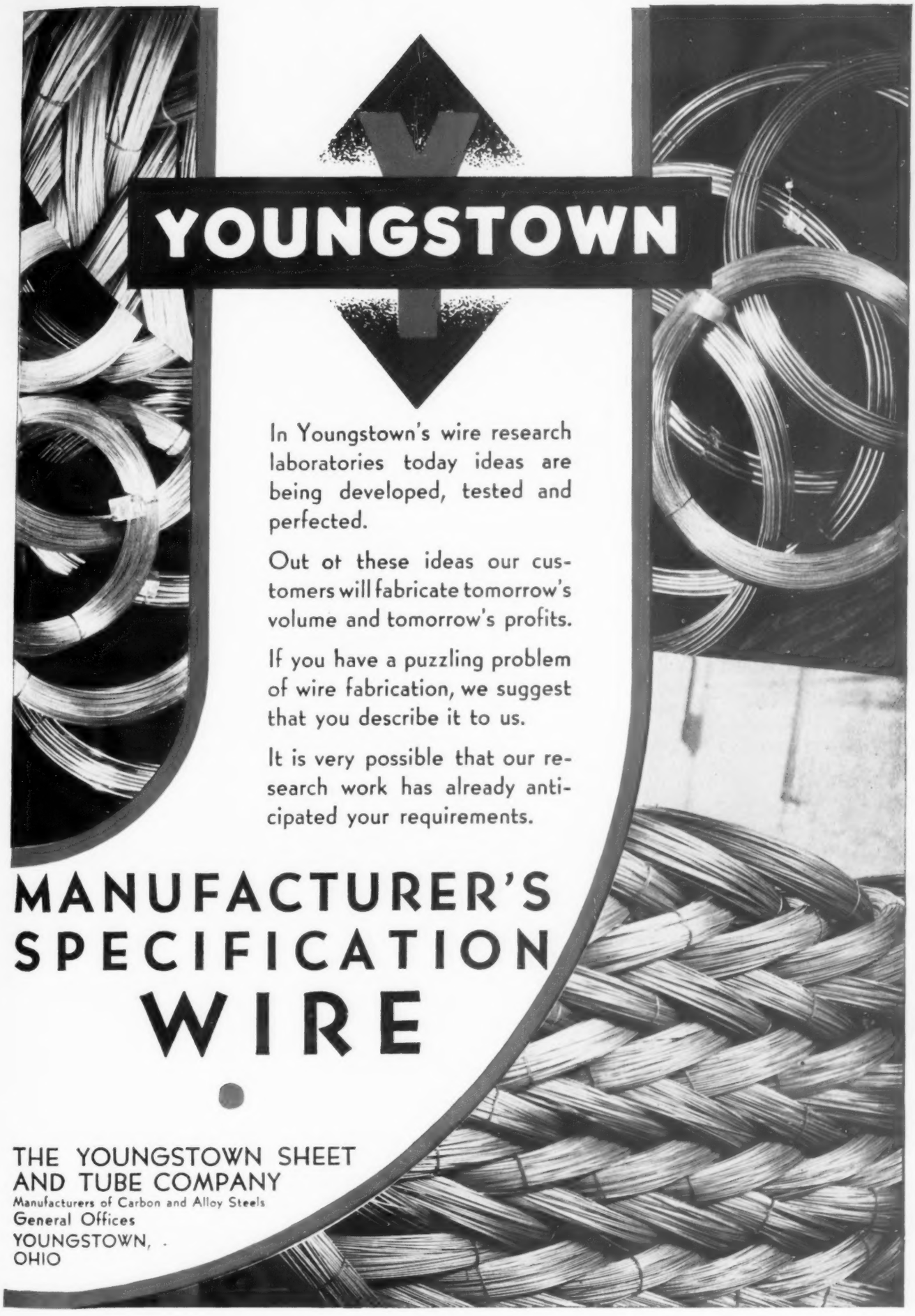
J. R. Townsend, general development laboratory, Bell Telephone Laboratories Inc., New York, as chairman presented the report of committee B-6 on die cast metals and alloys, which included a proposed tentative specification for lead and tin base alloy die castings. That specification gives chemical composition of five grades in order of decreasing tin content. In addition, the report mentioned a study of aluminum base die casting alloys which has been completed; completion of the testing of zinc and aluminum alloys from the 5-year indoor and outdoor corrosion racks, and the finishing of die castings.

Proposed tentative specifications for lead-coated copper sheets were recommended for publication by the society in the report of committee B-2 on nonferrous metals and alloys which was presented by E. E. Thum, editor *Metal Progress*, Cleveland. This committee functions under the chairmanship of R. F. Mehl, director, metals research laboratory, Carnegie Institute of Technology, Pittsburgh.

Sheets and Shapes for Switchgear



METAL CLAD ELECTRICAL SWITCHGEAR has brought to the fore a widening use of cold-rolled sheet steel and structural shapes. It is estimated the electrical industry is using approximately 2,000,000 pounds of cold-rolled full pickled sheets for this type of switchgear covering, with over 1,500,000 pounds of structural shapes required. Sheets generally are either 9 or 11-gage hot-rolled sections cut from sheets up to 66 x 120 inches. Material generally specified is low-carbon pickled annealed and oiled, suitable for bending and welding. The front panels are cold-rolled full pickled sheets. At the Fort Peck dam substation, Fort Peck, Mont., 25 metal clad switch gear units, such as the above, control the incoming line condenser, starting, running and feeder circuits for the dredging project now underway. The units, built by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., are self-contained with the potential transformers, current transformers, relaying and metering equipment mounted integrally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NEW EQUIPMENT

These items of industrial equipment were announced by manufacturers last week and will be described in an early issue of STEEL:

Sleeve clutch for power presses, Niagara Machine & Tool Works, Buffalo.

Controls for steam boilers, Shallcross Controls Inc., Milwaukee.

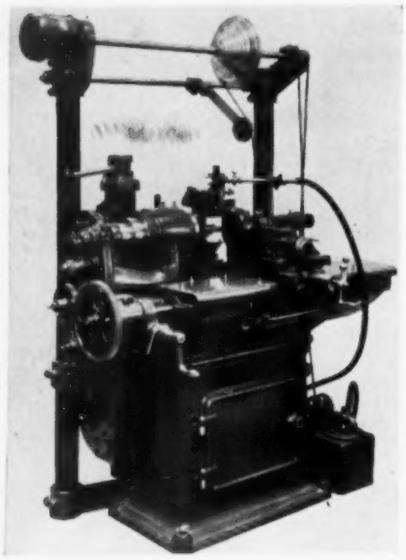
Barrel plating unit, Udylite Co., Detroit.

Magnetic clutch coupling, Dings Magnetic Separator Co., Milwaukee.

Metal marking machine, Quality Die Co., South Chicago, Ill. (Incorrectly given last week).

Thread Grinding Machine—

Triplex Machine Tool Corp., 125 Barclay street, New York, has placed on the market a new thread grinding machine for toolroom use, manufactured by the Societe Genevoise d'Instruments de Physique, Geneva, Switzerland, for which it is American sales agent. Shown in the accompanying illustration, the machine is intended for finish grinding of precision screw threads for external and



New Genevoise toolroom machine for finish grinding of precision screw threads

internal gages and taps and hardened production thread parts. It is driven through a backshaft and cone pulley by a 2-horsepower electric motor and has six workhead speeds. Eight wheel spindle speeds are obtained by means of a grooved pulley on the shaft shown overhead, which is driven by a 1-horsepower motor.

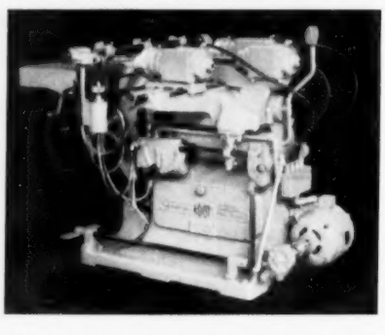
The machine has a master leadscrew which, protected from grinding dust and dirt, permits accuracy to plus or minus 0.0001-inch. The leadscrew has a correcting device. A suitable water pump and pipe system is furnished for wet grinding. By means of a diamond truing device 60-degree threads or other angles, as well as Whitworth threads, can be obtained. The profile angle of the wheel and of the work piece during grinding can be observed through a vertical microscope fitted over the top of the wheel. The grinding wheel head can be tilted to any angle of helix formed by the threads to be ground.

The machine can be used for grinding male threads from 3/16-inch to 6-inch in diameter and up to 12 inches in length between centers. Grinding of male threads is done between centers, the work piece being driven by suitable dogs. For female threads the grinding capacity is from 1¼-inch to 5 inches in diameter. A corrector for temperature also is furnished to take care of variations from 32 to 68 degrees Fahr.

♦ ♦ ♦

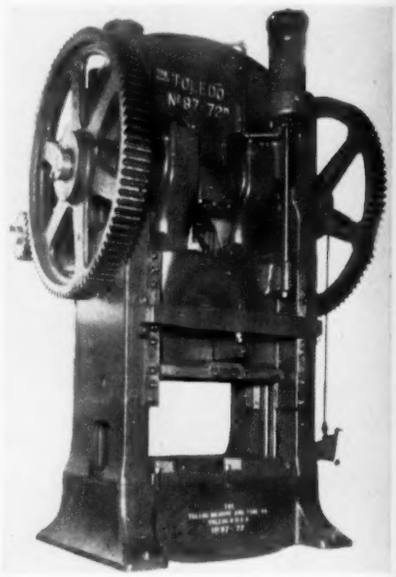
Boring Machine—

B. M. Root Co., York, Pa., has developed a new electrohydraulic boring machine for woodworking, the equipment being shown in an accompanying illustration. In operation the stock is placed on a station-



Root electrohydraulic boring machine for woodworking operations

ary table and automatically and hydraulically clamped in position. The electric boring spindles, mounted on the spindle rail, automatically and by hydraulic power move toward the stock; bore to predetermined depth; and return in 2 to 1 ratio to their original position. The machine regularly is furnished as a three-spindle unit for boring and countersinking regularly or irregularly spaced holes within a boring length of 48 inches. Outside spindles are radial and have



Twin-driven Toledo press, redesigned for improved appearance and constructed of improved engineering materials

an out-of-line adjustment of 5 inches. Adjacent spindles may be spaced as close as ⅞-inch. Base column, table and spindle frame are each heavy one-piece castings, ribbed and proportioned to withstand shock and vibration. Throttle valve permits variation from 0 to 35 strokes per minute.

♦ ♦ ♦

Presses—

Toledo Machine & Tool Co., Toledo, O., announces the completion of considerable redesigning of its line of presses to improve appearance and the engineering materials used. As shown in the accompanying illustra-

BETHADUR AND BETHALON

STAINLESS STEELS by BETHLEHEM

INDUSTRY today is stainless-steel minded. Stainless steels are constantly being assigned to new tasks calling for superlative resistance to heat, acids, and the ravages of the atmosphere.

Whatever the contemplated use, there is a grade of Bethadur or of Bethalon that will exactly fill the bill, in respect to both the needed working qualities and the particular kind of corrosion involved. Developed in Bethlehem Steel Company laboratories, these great steels cover the entire range of materials commonly referred to as stainless steels and irons.

Bethalon has become extensively known as a free-machining stainless steel. Equally outstanding in its own field is each of the nine grades of Bethadur. Brief descriptions of these steels appear on the following page. For detailed information on their properties and working send for booklet on Bethadur and Bethalon.

Bethlehem also makes the lower-chromium type steels of the stainless group, containing 4 to 6 per cent chromium with various additions of molybdenum, tungsten and vanadium.

Prominent among Bethlehem Stainless Steel Products are the following: . . . . Bars, hot-rolled, cold-drawn, centerless-ground and polished. A specialty is made of highly-polished stainless-steel bars particularly adapted to the pump and valve industry . . . Plates and angles . . . Forgings, drop and hammer . . . Bolts and nuts.

BETHLEHEM STEEL

BETHADUR 1

BETHADUR 1 is of the standard stainless-iron type. It possesses excellent corrosion-resisting properties in either the heat-treated or annealed condition. It is readily forged, can be machined without great difficulty, and may be heat-treated to secure high physical properties.

BETHADUR 2

BETHADUR 2 is the type commonly known as 18-8 stainless steel. It finds application where extreme resistance to atmospheric corrosion is required, particularly in ornamental parts which must retain their lustre over long periods of time without frequent cleaning and polishing. It is non-magnetic.

BETHADUR 3

BETHADUR 3 is primarily an acid-resisting steel and shows very little loss in weight when subjected to sulphuric or hydrochloric acid in mild concentrations. Therefore, it finds particularly wide use in chemical-plant apparatus, pickling equipment, and similar applications.

BETHADUR 4

BETHADUR 4 is similar to Bethadur 1, in that it requires no heat-treatment to bring out its maximum corrosion-resisting properties. Bethadur 4 is suitable for applications where high resistance to atmospheric attack is required, but where physical properties are relatively unimportant.

Bethadur 4 is particularly recommended for exterior trim, ornamental objects, and all other purposes not requiring the exceptionally high corrosion-resistance of Bethadur 2.

Bethadur 4 is the most malleable of all straight chromium-iron alloys. This property makes it particularly fitted for purposes where drastic cold work is encountered.

Bethadur 4 is an excellent heat-resisting steel. Under continuous service it will resist oxidation up to about 1200 deg. F., and will stand temperatures up to 1600 deg. F., for short periods of time without scaling.

BETHADUR 5

BETHADUR 5, with unusually high chromium content, is intended for use where exceptional corrosion-resistance is required, or dilute acids encountered. It is extensively used in the nitric-acid industry.

Bethadur 5 is sometimes used as a heat-resisting steel, though the higher carbon content of Bethadur 9 makes the latter alloy more desirable from a strength standpoint.

BETHADUR 6

BETHADUR 6 is the hardening grade of corrosion-resisting steel, sometimes called the cutlery grade. It is used in the manufacture of non-corroding parts that must be hardened.

BETHADUR 7

BETHADUR 7 has a high carbon content, making it suitable for parts in which a higher degree of hardness is needed. It is commonly used where hardness or abrasion-resistance is required in the presence of steam, water, salt water, mine water, oil and oil products.

Where extreme hardness is required the still-higher carbon Bethadur 8 should be used.

BETHADUR 8

WITH Bethadur 8 a maximum Rockwell "C" scale hardness of 60 can be obtained when the steel is quenched at temperatures in excess of 1850 deg. F. Other characteristics are the same as those of Bethadur 7.

BETHADUR 9

WHILE Bethadur 9, because of its high chromium content, is a corrosion-resisting steel, it is primarily intended for use in parts subjected to high temperatures.

Temperatures as high as 2100 deg. F. do not oxidize or scale the surface of Bethadur 9.

BETHALON

BETHALON A

BETHALON A, while easy-machining, possesses all of the excellent corrosion-resisting properties of straight carbon-chromium irons.

Bethalon A can be turned, drilled, bored or threaded as easily as ordinary screw stock, with the same tool set-up and the same feed, speed, and depth of cut. Excellent threads can be cut at 150 to 175 surface ft. per min.; it can be smooth-turned at 200 surface ft. per min.

BETHALON B

BETHALON B possesses corrosion-resisting properties equal to those of Bethadur 2, and is recommended for all uses where the rapid performance of intricate machining operations is important.

Bethalon B is not quite as machinable as Bethalon A, and must be machined at a somewhat lower speed than screw stock, though approximately twice the cutting speeds of standard 18-8 stainless can be used. The cutting speed is to some extent dependent on the type of screw-machine used, but speeds of from 80 to 90 surface ft. per min. can be maintained without the necessity for too frequent regrinding of tools

Bethlehem District Offices are located at Atlanta, Baltimore, Boston, Bridgeport, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Houston, Indianapolis, Kansas City, Milwaukee, New York, Philadelphia, Pittsburgh, St. Louis, St. Paul, Washington, Wilkes-Barre, York. *Pacific Coast Distributor:* Pacific Coast Steel Corp., San Francisco, Seattle, Los Angeles, Portland, Honolulu. *Export Distributor:* Bethlehem Steel Export Corp., New York.

BETHLEHEM STEEL COMPANY
GENERAL OFFICES: BETHLEHEM, PA.

tion, lines have been smoothed out to eliminate corner and dust pockets wherever possible. Backing the appearance is a carefully worked out plan for increasing the strength of sections, for distribution of the metal in the most efficient manner and elimination of any possible strain lines by the use of ample radii.

Frame members are alloy castings of high tensile strength and surface hardness. Shrunk steel rods are designed to protect the press from overloading on the heavy bottoming operations on which it is employed. The press is equipped with mechanically controlled self-adjustng pneumatic friction clutch with fast action, permitting a considerably increased production rate over the older clutches. The equipment also includes pneumatic counterbalance cylinders, cross bar knockout in slide and direct connected liftout in the bed.

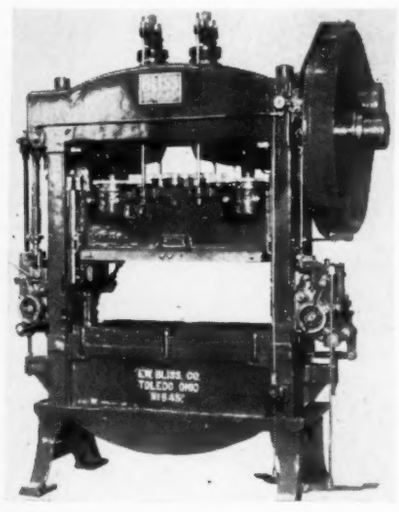
♦ ♦ ♦

High-Speed Press—

E. W. Bliss Co., Toledo, O., with press plants in that city, Brooklyn, N. Y., and Hastings, Mich., announces an addition to its line of high-speed automatic presses. The new machine is 48 inches between housings, adapting it to the use of follow dies of considerable length. It is regularly rated from 45 to 65 tons, depending on the character and duration of the load. It is arranged with multiple-speed or variable-speed drive for operating speeds up to 250 to 300 strokes per minute for the non-geared machine and up to 150 to 175 for the longer stroke geared machine for drawing operations of appreciable depth.

The use of heavy sections, special gibbing of an accurate type and the double-crank construction with heavily ribbed crown and the shrunk tie-rod frame contribute toward long die life, a valuable feature where expensive multiple operation tools are used. The equipment includes high-speed double roll feeds, substantial scrap shear with blade clearance adjustment, spring counterbalance for the slide, automatic force-feed lubrication and a foot controlled starting mechanism which is essential for efficient production on strip feeding and which is a convenient feature in starting and restarting of coil stock.

A typical illustration of work performed in this machine is an automatic speedometer bezel produced from coil stock with a piercing operation between blanks to relieve the metal so that the die centers can be maintained during the drawing operation.

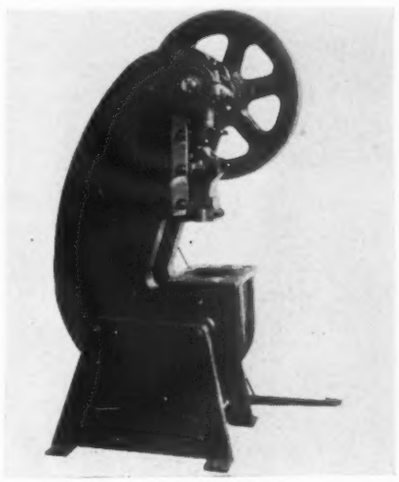


New high speed, automatic press, patented by E. W. Bliss Co., is 48 inches between housings and is regularly rated at 45 to 65 tons

♦ ♦ ♦

Press Frame—

Quickwork Co., St. Marys, O., announces a new design of welded steel press frame for replacing broken cast iron frames. In the accompanying illustration is shown a 2¾-inch crankshaft inclinable press thus rebuilt. The company is prepared to rebuild all sizes and makes of inclinable presses, both flywheel and back-geared types, in this manner. The cost is said to be comparable to that of a new cast iron frame. Side members of the new frame are box sections so that the weight of the new frame is less than that of the cast iron frame it replaces.

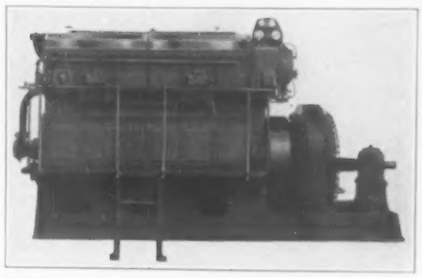


A crankshaft inclinable press rebuilt with a Quickwork welded steel frame after the original cast frame had broken

♦ ♦ ♦

Improved Diesel Engines—

Cooper-Bessemer Corp., Mt. Vernon, O., has made several improvements in its line of diesels, climaxed by the introduction of a new "N" line of multi-cylinder engines. Four new engineering developments are incorporated—steel through-bolts connect the cylinder heads to the bases, putting the cylinder block and centerframe in compression; cylinder liners are suspended from cylinder heads instead of being pinched between heads and cylinder block; new wristpin construction practically doubles effective wristpin bearing areas; and a patented atmospheric-relief injection system is used. Largest of the new line, shown herewith, has power cylinders 10½ inches in diameter, 13½ inches stroke, rated from 50 to 75 horsepower per cylinder. Horsepower rating depends on the speed and service. Intermediate and small sizes also are built, all in units of 3, 4, 6 and 8 cylinders.



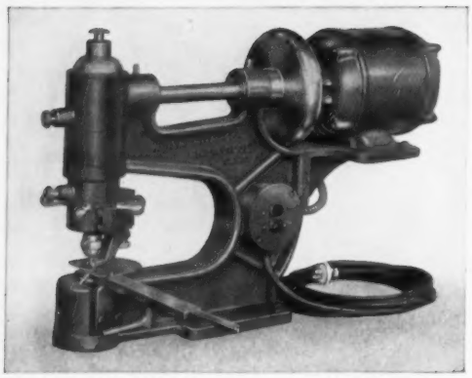
Type GN in new line of Cooper-Bessemer diesel engines, built in 3, 4, 6 and 8 cylinders

♦ ♦ ♦

Barrel and Drum Lifting Hook—

Morse Mfg. Co. Inc., Syracuse, N. Y., recently brought out a barrel and drum hook for lifting barrels and drums with chain block and tackle in storage space with overhead track or for handling drums with service car equipped with wrecking crane.

Hook lifting barrels and drums, designed by Morse Mfg. Co.



W. J. Savage Co. Inc. offers this bench-type nibbling machine with capacity of ⅛-inch in mild steel and 1/16-inch in alloy steel

The device, shown herewith, is light, strong and easy to handle, and has wide malleable iron hooks assembled with welded steel ring by double steel rods.

♦ ♦ ♦

Nibbling Machine—

W. J. Savage Co. Inc., Knoxville, Tenn., recently brought out a new nibbling machine designated No. 109. The unit, shown herewith, is a bench model and has a capacity of ⅛ inch in mild steel and 1/16 inch in tough alloy steels. General specifications include a 9-inch throat depth, 36 to 60-inch feed per minute, direct drive and ¼ horsepower repulsion start induction motor.

There are no moving parts in front except the cutting tool. The machine comes equipped with a patented tool holder assembly, and is designed for both template and line cutting. Adjustable tools and dies, revolving head, and an adjustable ram bushing are other features.

♦ ♦ ♦

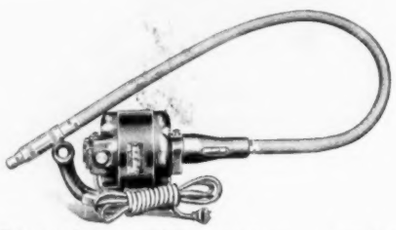
Rolled Steel Floor Plate—

Central Iron & Steel Co., Harrisburg, Pa., has introduced a third pattern in its line of rolled steel floor plates, known as the "all-way-grip" design and shown in an accompanying illustration. Projections are of the same contour as the two other designs, but are oriented differently. The design matches equally well on sides or ends, providing maximum economy and minimum wastage in shearing. Each diamond projection centers the next one at right angles, while the knob offers additional resistance and protection against slippage. Standard thicknesses range from 5/32 to 2 inches; widths from 20 to 76 inches; lengths from 108 to 300 inches, depending upon thickness and width. Weights per square foot range from 7.4 to 82.6 pounds. The plate can be rolled also in aluminum, copper and other materials.

♦ ♦ ♦

Flexible-Shaft Outfit—

Hergi Mfg. Co., 250 Fifth street, Bridgeport, Conn., is supplying outfits equipped with a new flexible shaft, sheath and handpiece. One



Direct-drive ¼-horsepower flexible shaft unit developed by Hergi Mfg. Co.

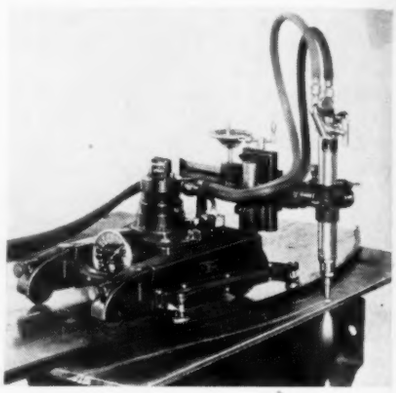
double-duty type is shown in the accompanying illustration. The flexible shaft is provided with fishtail on motor end and is threaded to the high-speed ball and roller bearing handpiece on the other. The outfit may be suspended or used on a bench. Use is made of a ¼-horsepower motor with switch built in the end bracket. Rubber sheath telescopes into cone connection for adjustment. A heavy rubber molded drop cord and plug, 10 feet in length, is supplied. Weighing 36 pounds, the outfit is suitable for high-speed grinding, rotary filing, buffing, polishing and similar operations.

♦ ♦ ♦

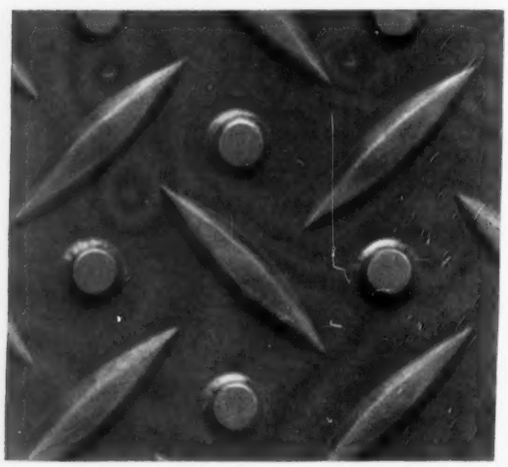
Attachment for Radiagraph—

Air Reduction Sales Co., 60 East Forty-second street, New York, has developed a new side roller attachment for its No. 4 radiagraph, a portable, motor driven, oxy-acetylene cutting machine. By means of the attachment and a templet shaped to guide the machine and torch over a desired outline, as shown in the accompanying illustration, the radiagraph is adapted for reasonably accurate cutting of irregular shapes, involving long, sweeping curves either simple or compound. The side roller attachment is an assembled unit, made either right or left hand, and is attached to the side of the radiagraph by means of machine screws. The design of the attachment places one of the rollers at a greater distance from the body of the radiagraph than the other so that when both rollers are in contact with the templet the machine faces slightly in. As a result, the machine, as it travels along, is continually tending to move in toward the templet, exerting a pressure which forces it to follow the templet either in a straight line or around a curve.

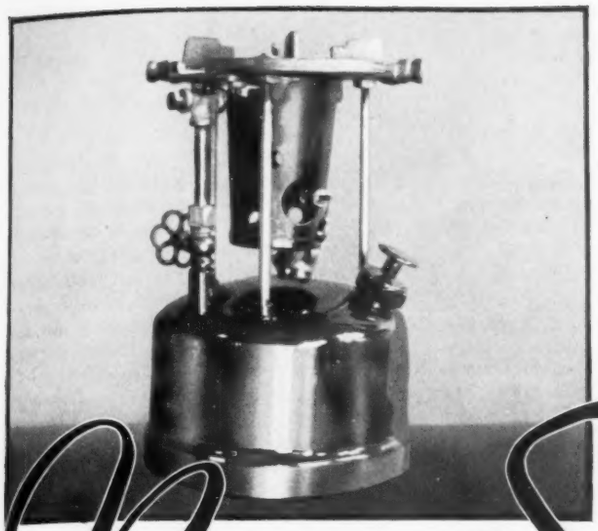
Left hand and right hand attachments make possible the construction of a templet which permits the use of two machines simultaneously.



By means of new side roller attachment this Airco portable radiagraph is adapted for cutting irregular shapes with reasonable accuracy



"All-way-grip" rolled steel floor plate supplied in various sizes and thicknesses by Central Iron & Steel Co.



Now Seamless

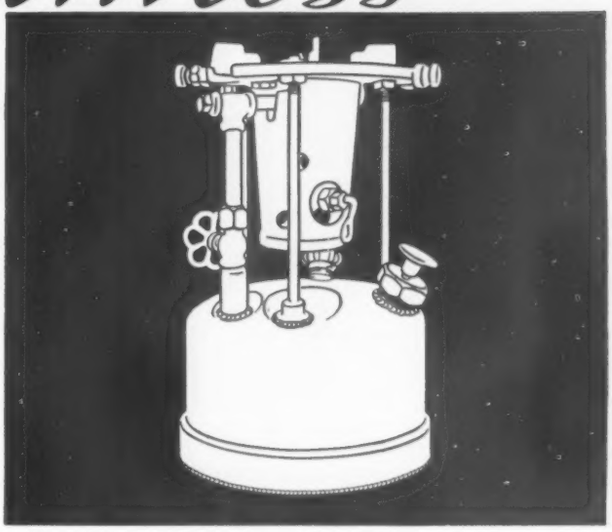
SALES IMPROVED BY WELDING . . .

● In the better gasoline or kerosene furnace, soldered seams have been eliminated. A new standard has been set. Jointless construction, so easily accomplished by welding, has given this furnace competitive advantages in performance, durability, safety, and appearance. These advantages mean greater *salability*.

The evolution of this improved gasoline furnace was through a widely recognized application of welding.

Welding has made many good products better—refrigerators, automobiles, radios, streamlined locomotives, metal furniture, and a thousand other things. You may find it profitable to consider the advantages in both production and sales which can be gained for your product by jointless design-for-welding.

When you decide to do this, take advantage of the wide experience of the Linde organization in design and welding fabrication. Linde Process Service will make this experience available to you. You can arrange for this service—as a hundred thousand other business organizations have—by telephone, by telegraph, or by mail, to the nearest Linde Office.



● *Oxwelding was an important factor in the evolution of this better furnace. Soldered seams gave way to strong, jointless construction; possible only with welding.*

Linde Offices are located in Atlanta – Baltimore, Birmingham, Boston, Buffalo, Butte–Chicago, Cleveland–Dallas, Denver, Detroit – El Paso – Houston – Indianapolis–Kansas City–Los Angeles–Memphis, Milwaukee, Minneapolis – New Orleans, New York – Philadelphia, Phoenix, Pittsburgh, Portland, Ore. – St. Louis, Salt Lake City, San Francisco, Seattle, Spokane – Tulsa. Address The Linde Air Products Company, Unit of Union Carbide and Carbon Corporation.

Everything for Oxy-Acetylene Welding and Cutting

LINDE OXYGEN • PREST-O-LITE ACETYLENE • OXWELD APPARATUS AND SUPPLIES

FROM PRODUCTS OF UNITS OF UCC UNION CARBIDE AND CARBON CORPORATION LINDE UNION CARBIDE

New Trade Publications

Tools—Bonney Forge & Tool Works, Allentown, Pa. Catalog No. 35 lists and illustrates tools and wrenches.

Grinding Wheels — Norton Co., Worcester, Mass. A booklet tells the story of diamonds in grinding wheels for many industrial uses.

Gages—Hays Corp., Michigan City, Ind. Catalog PGA-35 features pointer gages for draft, pressure, differentials, temperature, in various types.

Furnaces—Hevi Duty Electric Co., Milwaukee. Bulletin ND-635 describes pot-type furnaces for heat treatment of small parts, with specifications.

Motors—Louis Allis Co., Milwaukee, bulletin No. 601. Special features and characteristics of electric motors for centrifugals, with performance charts.

Anti-Rust—Skybrite Co., Cleveland. Its anti-rust preparation turns the rust into a harmless, water-free oxide that protects against further corrosion.

Welding — Lincoln Electric Co., Cleveland. Study in structural arc welding, plate 50, showing fixed end connections of beams to girders, with diagrams.

Floor Plate—Inland Steel Co., Chicago. A leaflet on its 4-way steel floor plate shows how it brings safety, giving gages, widths, weights and other specifications.

Tooling—Cimatool Co., Dayton, O. Eight pages full of suggestions for reducing costs of tooling are presented in a booklet telling of modern methods.

Switches—Electric Controller & Mfg. Co., Cleveland. Type A safety switches, especially suited to industrial applications, are featured in a folder, with illustrations and diagrams.

Rubber Equipment — Manhattan Rubber Mfg. division of Raybestos-Manhattan Inc., Passaic, N. J. A new 56-page general catalog lists standard rubber products for industry.

Grinders—Landis Tool Co., Waynesboro, Pa. Catalog A-35, plain hydraulic grinders, type D, 10, 14 and 16-inch, described and illustrated, with specifications, tables.

Bearings—S.K.F. Industries Inc., Front street and Erie avenue, Philadelphia. A 76 page edition of engineering data sheets covers a wide scope of bearing information.

Boiler — Combustion Engineering Co. Inc., 200 Madison avenue, New York. A leaflet on compact, efficient bent tube boilers of all sizes, with dimension table.

Impact Wrench — Ingersoll-Rand Co., 11 Broadway, New York. Illustrated bulletin on wrench for placing or removing nuts, illustrated to show applications.

Aluminum—Aluminum Co. of America, Pittsburgh. A revised edition of its booklet on Alcoa aluminum and its alloys, the company says, is the most comprehensive booklet on aluminum it has for distribution.

High-Temperature Mortars—Harbison-Walker Refractories Co., Farmers Bank building, Pittsburgh. Folders on three high temperature bonding mortars with list of applications.

Recovery Stills—Barnstead Still & Sterilizer Co. Inc., 2 Lanesville terrace, Forest Hills, Boston. Folder on solvent recovery stills for industrial use to reclaim processing materials.

Crane Wheels—American Manganese Steel Co., 389 East Fourteenth street, Chicago Heights, Ill. Bulletin and dimension sheet on double-walled crane track wheels.

Belt Conveyors—Link-Belt Co., 910 South Michigan avenue, Chicago. Folder No. 1414, portable belt conveyors for industrial plants, retail coal yards, contractors, for loose or bagged materials.

Electro-plating—U. S. Galvanizing & Plating Equipment Corp., 27 Heyward street, Brooklyn, N. Y. Methods and equipment for electro-plating are set forth in a new booklet, including metal cleaning, pickling, acid dipping, drying.

Materials Handling—Chain Belt Co., Milwaukee. Catalog, a picture book showing how to handle materials in various industries by chain and belt conveyors. The pictures do the talking.

Porcelain Enamel — Porcelain Enamel Institute Inc., 612 North Michigan avenue, Chicago. A sales manual for enamel; pictures and some text recall the many uses and extraordinary service it renders in everyday life.

Electrical Equipment — General Electric Co., Schenectady, N. Y., Bulletin No. GEA-1972, high-speed oil-tight circuit breaker for 50,000-kva service; GEA-2123, outdoor dropout fuse disconnecting switches; GEA-2127, knife switches.

Evaporators—Young Radiator Co., Racine, Wis., catalog No. 535. Evaporators for direct expansion systems using freeon and methyl chloride, diagrams and data tables. Catalog No. 435, heat transfer surfaces for air conditioning and commercial applications.

Stainless Steels—Electro Metallurgical Co., 30 East Forty-second street, New York. A bulletin containing information of interest to fabricators and users of stainless steels, showing how addition of columbium to austenitic steels eliminates intergranular corrosion.

How Capital Is Formed Under American Procedure

Formation of Capital, by Harold G. Moulton; cloth, 201 pages, 5 x 8 inches; published by the Brookings Institution, Washington; supplied by STEEL, Cleveland, for $2.50, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

A series of four studies has been undertaken by the Brookings Institution on the distribution of national wealth and income in relation to economic progress. The volume under review is the third. Preceding it the institution issued "America's Capacity to Produce," and "America's Capacity to Consume." The purpose of the investigation is to determine whether existing distribution of income in the United States among various groups in society tends to impede efficient functioning of the economic system.

This volume analyzes factors involved in transforming money savings into capital equipment. It challenges traditional conceptions as to the forces which govern growth of productive capital; demonstrates dependence of capital expansion upon consumptive demand and discloses how excessive savings may produce financial disorder rather than new capital goods. A series of diagrams and charts illustrates the text.

British Institute Considers Alloys and Corrosion Work

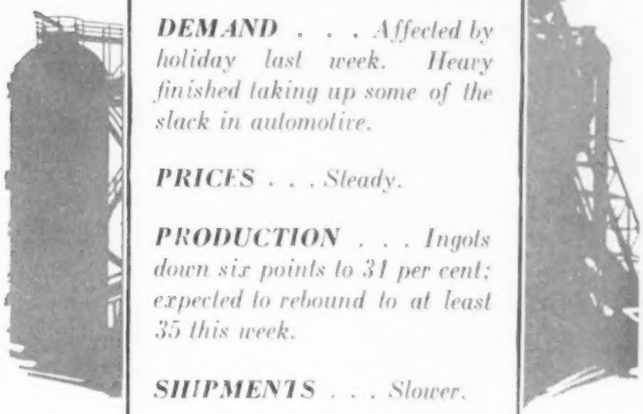
(*Concluded from Page* 39)

that there is a lack of uniformity in the hardness of silico-manganese steels, and it was suggested that in that case water quenching might give better results than oil quenching. One speaker, referring to the authors' statement that chromium-vanadium steels were the best, emphasized the point that this is purely from the metallurgical point of view. The speaker also questioned the statement that the degree of decarburization increases in the course of rolling, and he did not agree with the authors that silico-manganese steels are inferior to plain carbon steels.

W. E. W. Millington, London, Midland & Scottish Railway Co., stated that he had used raw linseed oil for quenching from 850 to 900 degrees Cent. He also said that in his experience silico-manganese steels are superior to ordinary carbon steels. Another speaker, representing the point of view of spring makers, referred to the tests on spring plates and emphasized the fact that the conclusions arrived at in these tests were not the same as those arrived at in the tests made on actual springs. Another speaker pointed out that the section of the plate has an influence on heat treatment, and that heat treatment of spring plates is a most important factor.

Scrap Reflects Increasing Market Strength

Larger Consumer Orders; Holiday Cut in Steel Rate Sharp, but Short



MARKET IN TABLOID

DEMAND *. . . Affected by holiday last week. Heavy finished taking up some of the slack in automotive.*

PRICES *. . . Steady.*

PRODUCTION *. . . Ingots down six points to 31 per cent; expected to rebound to at least 35 this week.*

SHIPMENTS *. . . Slower.*

A REBOUND to at least 35 per cent is expected in steelworks operations this week, following the artificial low consequent to holiday suspensions last week, when the rate dropped 6 points to 31 per cent.

In every district except New England and Youngstown production is scheduled to regain all its losses this week, and at Pittsburgh there will be an increase.

Sharp as was this midsummer recession, with many open hearths down for the entire week, and a majority of finishing mills idle several days, ingot production still was 9 points above that in the comparable period last year. Then the steel rate declined from 46 to 22 per cent, and in the ensuing week recovered only to 30 per cent.

The third quarter, therefore, begins under more favorable conditions, and steelmakers, taking a long-range view of the markets, appear impressed with prospects which lie just ahead.

A factor for strength is the increasing interest manifested by steelmakers in scrap, and the firmness of prices, as scrap dealers are loath to part with supplies. A valley steelworks is reported to have purchased 40,000 to 50,000 tons. Dealers' and consumers' stocks are estimated as 30 to 40 per cent less than at this time last year.

Temporarily, too, automobile assemblies made a sharp dip, to 59,000 for the week, down 30,000. The retail market for automobiles is proving much stronger than anticipated, and this has led makers to slow down programs for introducing new models. Some will not start until Sept. 1, or 30 days later than they had planned.

Steelmakers look for substantial releases for new models by Aug. 10, but these may be deferred. In the meantime, General Motors and others have placed additional orders for materials for present models. Chrysler's contract with Midland Steel Products Co. for frames will benefit a Cleveland strip producer by at least 30,000 tons, although this is a variable, depending upon actual releases for new cars.

While leading automobile manufacturers are renewing pressure for preferential prices based on tonnage, Toledo steel consumers have started a drive to abolish the practice adopted by steelmakers in 1933 whereby the latter absorb some of the freight from eastern mills to Michigan, thus giving Michigan a lower delivered price than Toledo.

Shape awards for the week totaled 20,907 tons. The Mississippi Valley Barge Lines Co., St. Louis, is to close this week on barges requiring 10,000 tons of plates.

New York placed a $19,220,000 order for 500 subway cars. Final figures on June freight car awards total 5151, bringing the number for the first six months to 6333, compared with 23,259 in the period last year.

Daily average pig iron production in June—51,949 gross tons—was 7.2 per cent less than in May, and output for the month—1,558,463 tons—was down 10.2 per cent. For six months, the total of 9,829,934 tons is lower by 0.22 per cent than that in the first six last year. The number of stacks in blast June 30 was 91, only five less than on May 31. A year ago the number was reduced 25 to 92.

Due mainly to increased imports of pig iron in May, total iron and steel imports for that month increased 65.5 per cent over April to 47,719 gross tons, largest since September, 1933.

Steelworks operations last week in the Detroit district declined 16 points to 78 per cent; Wheeling 8 to 40; Cleveland 30 to 16; Buffalo 3 to 29; Pittsburgh 10 to 20; Chicago 8 to 33; eastern Pennsylvania 8 to 21; Youngstown 16 to 26; New England 5 to 56. Birmingham was unchanged at 30.

STEEL's iron and steel price composite remains $32.39; the finished steel index, $54; and the scrap composite $10.34.

COMPOSITE MARKET AVERAGES

	July 6	June 29	June 22	One Month Ago June, 1935	Three Months Ago April, 1935	One Year Ago July, 1934	Five Years Ago July, 1930
Iron and Steel	$32.39	$32.39	$32.40	$32.42	$32.29	$32.32	$33.00
Finished Steel	54.00	54.00	54.00	54.00	54.00	54.05	51.90
Steelworks Scrap	10.34	10.34	10.38	10.45	10.75	10.30	12.58

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	July 6, 1935	June, 1935	April, 1935	July, 1934
Steel bars, Pittsburgh	1.80c	1.80c	1.80c	1.80c
Steel bars, Chicago	1.85	1.85	1.85	1.85
Steel bars, Philadelphia	2.11	2.11	2.09	2.09
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.75
Shapes, Pittsburgh	1.80	1.80	1.80	1.80
Shapes, Philadelphia	2.01½	2.01½	2.00½	2.00½
Shapes, Chicago	1.85	1.85	1.85	1.85
Tank plates, Pittsburgh	1.80	1.80	1.80	1.80
Tank plates, Philadelphia	2.00	1.99	1.98½	1.98½
Tank plates, Chicago	1.85	1.85	1.85	1.85
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.85
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.45
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.10	3.10
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	1.95
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.55	2.55
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	3.20
Plain wire, Pittsburgh	2.30	2.30	2.30	2.30
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	2.60	2.60	2.60	2.60

Semifinished Material

Sheet bars, open-hearth, Youngs.	$28.00	$28.00	$28.00	$28.40
Sheet bars, open-hearth, Pitts.	28.00	28.00	28.00	28.40
Billets, open-hearth, Pittsburgh	27.00	27.00	27.00	27.40
Wire rods, Pittsburgh	38.00	38.00	38.00	38.00

Pig Iron

	July 6, 1935	June, 1935	April, 1935	July, 1934
Bessemer, del. Pittsburgh	$19.81	$19.81	$19.76	$19.76
Basic, Valley	18.00	18.00	18.00	18.00
Basic, eastern, del. eastern Pa.	19.76	19.81	19.76	19.76
No. 2 foundry, del. Pittsburgh	19.31	19.31	19.26	19.26
No. 2, foundry, Chicago	18.50	18.50	18.50	18.50
Southern No. 2, Birmingham	14.50	14.50	14.50	14.50
No. 2X eastern, del. Philadelphia	20.68	20.68	20.63	20.63
Malleable, Valley	18.50	18.50	18.50	18.50
Malleable, Chicago	18.50	18.50	18.50	18.50
Lake Superior charcoal, del. Chi.	24.25	24.25	24.15	24.04
Ferromanganese, del. Pittsburgh	90.13	90.13	89.85	89.79
Gray forge, del. Pittsburgh	18.67	18.67	18.63	18.88

Scrap

Heavy melting steel, Pittsburgh	$12.00	$12.25	$11.70	$12.00
Heavy melt. steel, No. 2, east. Pa.	9.50	9.30	9.15	8.90
Heavy melting steel, Chicago	10.00	10.25	10.05	9.55
Rails for rolling, Chicago	10.75	11.25	11.05	10.85
Railroad steel specialties, Chicago	11.75	11.75	11.25	10.50

Coke

Connellsville, furnace, ovens	$3.40	$3.50	$3.60	$3.60
Connellsville, foundry, ovens	4.60	4.60	4.60	4.60
Chicago, by-product foundry, del.	9.25	9.25	9.25	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Sheet Steel

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.85c
Gary	1.95c
Chicago, delivered	1.98c
New York, del.	2.20c
Philadelphia, del.	2.16c
Birmingham	2.00c
St. Louis, del.	2.17c
Pacific ports, f.o.b. cars, dock	2.40c

Hot Rolled Annealed No. 24

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, delivered	2.60c
New York, del.	2.75c
Philadelphia, del.	2.71c
Birmingham	2.55c
St. Louis, del.	2.72c
Pacific ports, f.o.b. cars, dock	3.05c

Galvanized No. 24

Pittsburgh	3.10c
Gary	3.20c
Chicago, delivered	3.23c
Philadelphia, del	3.41c
New York, del.	3.45c
Birmingham	3.25c
St. Louis, del.	3.42c
Pacific ports, f.o.b. cars, dock	3.70c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.07c

Cold Rolled No. 10

Pittsburgh	2.50c
Gary	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.81c
New York, del.	2.85c
Pacific ports, f.o.b. cars, dock	3.10c

Cold Rolled No. 20

Pittsburgh	2.95c
Gary	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.26c
New York, del.	3.30c

Enameling Sheets

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c
Gary, No. 10	2.60c
Gary, No. 20	3.20c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base con. (box) Pitts.	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.40c
Do., Gary	3.50c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold stp.	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh	1.80c
New York, del.	2.09c
Philadelphia, del.	1.99c
Boston, delivered	2.22c
Buffalo, delivered	2.05c
Chicago or Gary	1.85c
Cleveland, del.	1.99½c
Birmingham	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific ports, f.o.b. cars, dock	2.35c
St. Louis, delivered	2.07c

Structural Shapes

Pittsburgh	1.80c
Philadelphia, del.	2.01½c
New York, del.	2.06½c
Boston, delivered	2.20½c
Bethlehem	1.90c
Chicago	1.85c
Cleveland, del.	2.00c
Buffalo	1.90c
Gulf Ports	2.20c
Birmingham	1.95c
Pacific ports, f.o.b. cars, dock	2.35c

Bars

Soft Steel

Pittsburgh	1.80c
Chicago or Gary	1.85c
Duluth	1.95c
Birmingham	1.95c
Cleveland	1.85c
Buffalo	1.90c
Detroit, delivered	1.95c
Pacific ports, f.o.b. cars, dock	2.35c
Philadelphia, del.	2.11c
Boston, delivered	2.22c
New York, del.	2.15c
Pitts., forg. qual.	1.95c-2.05c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.70c
Chicago or Gary	1.75c
Moline, Ill.	1.75c
Cleveland	1.75c
Buffalo	1.80c

Iron

Troy, N. Y.	1.70c
Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia	1.91c
Pittsburgh, refined	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.36c

Rail Steel

Straight lengths quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight or mixed carloads; pool cars, or less, 15c up. 10% dis. on nail extras on stright or mixed carloads to one consignee.)

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
do., 16 gage and finer	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.00c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$63.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	2.90c

Do., Chicago up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs	1.95c
20,000 to 59,999 lbs.	1.90c
60,000 to 99,999 lbs.	1.85c
100,000 lbs. and over	1.82½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.45c

Alloy	Diff.	Alloy	Diff.
S.A.E.		S.A.E.	
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.....0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni. 1.05
5100 0.80-1.10 Cr.....0.45
5100 Cr. spring.....base
6100 bars 1.20
6100 spring 0.70
Cr., Ni., Van. 1.50
Carbon Van. 0.95
9250.....Carbon base plus extras

Piling

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops

Hot strip to 23⅝-in.

Pittsburgh	1.85c
Chicago, base	1.95c
Birmingham base	2.00c
Detroit, delivered	2.05c
Philadelphia, del.	2.16c
New York, del.	2.20c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold-rolled strip, Pitts., Cleve.	2.60c
Worcester, Mass.	2.80c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts.	
24-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$20.00
80-85 lbs.	$24.00
100 lbs.	$25.00
Light rails, billet qual. Pitts., Chi.	$35.00
Do., reroll. qual.	34.00
Angle bars, billet, Gary, Ind., So. Chi.	2.55c
Do., axle steel	2.10c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs. up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots, Dec. 1, 1932, lists, 10% extra for less full containers.

Carriage Bolts

All sizes, cut thread	70-10-5 off
Rolled thread, ½ x 6, smaller	70-10-5 off

Machine Bolts

All sizes cut thread lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts stud bolts	70-10-5 off
Tire bolts	60-5 off
Stove bolts, 75 off in pkgs.; 83 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.	
Rolled thread machine, ½ x 6, smaller	70-10-5 off
Step bolts	70-5 off
Elevator bolts	70-5 off

Nuts

S.A.E. semifinished hex.; ½ to ⅞-inch	70-10-5 off
Do., ½ to 1-inch	70-10-5 off
Do., over 1-inch	70 off

Hexagon Cap Screws

Milled	85-10 off
Upset, 1-in., smaller	87½ off

Square Head Set Screws

Upset, 1-in., smaller	80 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland..	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila., to jobbers & large nut, bolt mfrs.	$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. under 5 kegs; no discount on size extras	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

Butt Weld

In.	Blk.	Gal.
Steel		
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55
Iron		
½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

Lap Weld

Steel		
2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½
Iron		
2	37	22½
2½—3½	38	25
4—8	40	28½

Line Pipe

Steel	
⅛, butt weld	57½
⅛-inch, butt weld	50½
¼—⅜, butt weld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63
Iron	

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound. Less-carloads revised as of July 1, 1935 card.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$39.00-40.00
4-in., Birmingham	42.00-43.00
4-in., Chicago	50.40-51.40
6 to 24-in. Chicago	47.40-48.40
6-in. & over, east fdy.	43.00
Do., 4-in.	46.00

Class A pipe $3 over Class B.

Stnd. fitgs., Birm. base	$100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$27.00
Philadelphia	32.67
Duluth	31.00
Forging, Pitts., Chi. and Buffalo	32.00
Forging, Duluth	36.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	28.00

Slabs

Pitts., Cleve., Young.	27.00

Wire Rods

(Common; combination up $2)

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point	1.70c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.40- 3.60
Connellsville, fdry.	4.60
Connel. prem. fdry.	5.10- 5.35
New River fdry.	6.00
Wise county fdry.	4.45- 5.00
Wise county fur.	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	9.20- 9.65
Chi., ov., outside del.	8.50
Chicago, del.	9.25
New England, del.	11.00
St. Louis, del.	9.25
Birmingham, ovens	6.00
Indianapolis, del.	8.75
Cincinnati, del.	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit ov., out. del.	8.50
Philadelphia, del.	9.03

Coke By-Products

Per gallon, producers' plants.

Tank lots	Spot
Pure and 90% benzol	15.00c
Toluol	30.00c
Solvent naphtha	30.00c
Commercial xylol	30.00c

Per lb. f.o.b. New York.

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls., to jobbers	4.50c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices, ½-cent up.

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del.	14.50	14.50	13.50	19.00
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
Delivered from Basing Points:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
Baltimore from Birmingham	20.08	.....	18.96	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
Brooklyn, N. Y., from Bethlehem	21.93	22.43	.....	.....
Brooklyn, N. Y., from Bmghm.	21.55	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.	19.51	19.51	19.01	.....
Cincinnati from Birmingham	19.38	.....	19.40	.....
Cleveland from Birmingham	19.04	.....	18.92	.....
Indianapolis from Hamilton, O.	20.93	20.93	20.43	21.43
Mansfield, O., from Toledo, O.	20.26	20.26	19.76	20.76
Milwaukee from Chicago	19.57	19.57	19.07	20.07
Muskegon, Mich., from Chicago, Toledo or Detroit	21.60	21.60	21.10	22.10
Newark, N. J., from Birmingham	20.61	.....	.....	.....
Newark, N. J., from Bethlehem	20.99	21.49	.....	.....
Philadelphia from Birmingham	19.93	.....	19.1	.....
Philadelphia from Swedeland, Pa.	20.31	20.81	19.81	.....
Pittsburgh district from Neville Island	Neville base plus 67c, 81c and $1.21 switching charges			
Saginaw, Mich., from Detroit	20.75	20.75	20.25	20.25

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	19.00	19.00	18.50	.....
St. Louis from Birmingham	†18.62	.....	18.50	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

Low Phos

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $23.50. Phila. base, standard and copper bearing, $24.63.

Gray Forge		Charcoal	
Valley furnace	18.00	Lake Superior fur.	21.00
Pitts. dist. fur.	18.00	Do., del. Chicago	24.25
		Lyle, Tenn.	21.50

Silvery†

Jackson County, O., base; 6% $22.75; 7—$23.75; 8—$24.75; 9—$25.70; 10—$26.75; 11—$27.75. Buffalo base prices, up $1.25.

Bessemer Ferrosilicon†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

First Quality.

Pa., Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	45.00
Second Quality	
Pa., Ill., Ky., Md., Mo., Ga., Ala.	40.00
Ohio	
First quality	$40.00-45.00
Intermediary	37.00
Second quality	28.00

Malleable Bung Brick

All bases	50.00

Silica Brick

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	40.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$45.00
*Chemically bonded chrome brick	45.00
Magnesite brick	65.00
Chemically bonded magnesite brick	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$18.75-19.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$13.00-14.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base	85.00
Do., del. Pittsburgh	90.13
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	90.00
2% carbon, 95.00; 1%,	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17.-19% Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply.

Nonferrous Prices

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Chinese Spot, N. Y.	Nickel Cathodes
June 29	8.00	8.12½	7.25	51.75	50.80	4.00	3.85	4.30	*19.00	12.75	35.00
July 1	8.00	8.12½	7.25	51.75	50.80	4.00	3.85	4.30	*19.00	12.75	35.00
July 2	8.00	8.12½	7.25	51.80	51.00	4.00	3.85	4.30	*19.00	12.75	35.00
July 3	8.00	8.12½	7.50	51.90	51.10	4.00	3.85	4.30	*19.00	12.75	35.00
July 4—Holiday											
July 5	8.00	8.12½	7.50	51.90	50.90	4.05	3.90	4.30	*19.00	12.75	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 9.00c Conn. copper.

Sheets	
Yellow brass (high)	13.62½
Copper, hot rolled	15.00
Lead, cut to jobbers	7.75
Zinc, 100-lb. base	9.50
Tubes and Pipes	
High yellow brass	15.37½
Seamless copper	15.25
Rods	
High yellow brass	12.12½
*Copper, hot rolled	12.25
Anodes	
Copper untrimmed	12.75
Wire	
*Yellow brass (high)	14.12½

OLD METALS

Dealers' buying prices, cents lb.

No. 1 Composition Red Brass	
New York	4.25- 4.50
*Cleveland	4.25- 4.75
Chicago	4.25- 4.50
St. Louis	4.50- 4.75
Heavy Copper and Wire	
New York, No. 1	5.50- 5.75
Chicago, No. 1	5.25- 5.50
Cleveland	4.75- 5.00
St. Louis, No. 1	5.50- 5.75
Composition Brass Borings	
New York	3.87½-4.12½
Light Copper	
New York	4.25- 4.50
Chicago	3.75- 4.00
*Cleveland	4.00- 4.50
St. Louis	4.50- 4.75
Light Brass	
Chicago	2.00- 2.25
Cleveland	2.00- 2.25
St. Louis	2.25- 2.50
Lead	
New York	3.00- 3.12½
Cleveland	2.75- 3.00
Chicago	2.75- 3.00
St. Louis	3.00- 3.25
Zinc	
New York	2.00- 2.25
Cleveland	2.00- 2.25
St. Louis	2.50- 2.65
Aluminum	
Borings, Cleveland	7.50- 8.00
Mixed, cast, Cleve.	12.00-12.50
Mixed, cast, St. L.	11.75-12.00
Clips, soft, Cleve.	13.50-14.00
SECONDARY METALS	
Brass ingot, 85-5-5-5	8.00
Stand. No. 12 alum.	16.00-17.00

Iron and Steel Scrap Prices

Corrected to Friday night Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	8.50- 9.00
Boston, dock, expt.	8.50
Boston, domestic	7.00- 7.25
Buffalo, No. 1	10.50-11.00
Buffalo, No. 2	9.25- 9.75
Chicago, No. 1	9.75-10.25
Cleveland, No. 1	9.00- 9.50
Cleveland, No. 2	8.50- 9.00
Detroit, No. 1	8.00- 8.50
Detroit, No. 2	7.00- 7.50
Eastern Pa., No. 1	10.00-10.50
Eastern Pa., No. 2	9.50
Federal, Ill.	8.00- 8.50
Granite City, R. R.	8.50- 9.00
Granite City, No. 2	7.25- 7.75
N. Y., deal, No. 2	7.50
N. Y., deal. barge	8.50
Pittsburgh, No. 1	11.75-12.25
Pittsburgh, No. 2	10.25-10.75
St. Louis	7.50- 8.00
Valleys, No. 1	11.50-12.00

COMPRESSED SHEETS

Buffalo, dealers	9.25- 9.75
Chicago, factory	8.50- 9.00
Chicago, dealer	7.50- 8.00
Cleveland	8.00- 8.50
Detroit	8.50- 9.00
E. Pa., new mat.	10.00
Pittsburgh	11.75-12.25
St. Louis	6.25- 6.75
Valleys	11.00-11.50

BUNDLED SHEETS

Buffalo	7.00- 7.50
Cincinnati, del.	6.00- 6.50
Cleveland	6.00- 6.50
Pittsburgh	10.25-10.75
St. Louis	4.50- 5.00

SHEET CLIPPINGS, LOOSE

Chicago	6.00- 6.50
Cincinnati	5.50- 6.00
Detroit	5.00- 5.50
St. Louis	4.25- 4.75

STEEL RAILS, SHORT

Birmingham	12.00-12.50
Buffalo	13.00-13.50
Chicago (3 ft.)	12.50-13.00
Chicago (2 ft.)	13.00-13.50
Cincinnati, del.	11.00-11.50
Detroit	10.50-11.00
Pitts., open-hearth, 3 ft. and less	14.00-14.50
St. Louis, 2 ft.& less	12.00-12.50

STEEL RAILS, SCRAP

Boston	7.50- 8.00
Chicago	9.75-10.25
Pittsburgh	13.00-13.50
St. Louis	9.75-10.25

STOVE PLATE

Birmingham	5.75- 6.00
Boston, dealers	3.50- 3.75
Buffalo	9.00- 9.50
Chicago, net	6.00- 6.50
Cincinnati, dealers	5.50- 6.00
Detroit, net	5.75- 6.25
Eastern Pa.	8.50
N. Y., deal. fdry.	6.00
St. Louis	5.50- 6.00

COUPLERS, SPRINGS

Buffalo	12.75-13.25
Chicago, springs	11.50-12.00
Eastern Pa.	13.50
Pittsburgh	14.50-15.00
St. Louis	8.50- 9.00

ANGLE BARS—STEEL

Chicago	12.00-12.50
St. Louis	9.50-10.00

RAILROAD SPECIALTIES

Chicago	11.50-12.00

LOW PHOSPHORUS

Buffalo, billets and bloom crops	12.75-13.25
Cleveland, billet, bloom crops	14.00-14.50
Eastern Pa., crops	13.00-14.00
Pittsburgh, billet, bloom crops	15.00-15.50
Pittsburgh, sheet bar crops	13.50-14.00

FROGS, SWITCHES

Chicago	10.00-10.50
St. Louis, cut	9.75-10.25

SHOVELING STEEL

Chicago	9.75-10.25
Federal, Ill.	7.50- 8.00
Granite City, Ill.	7.50- 8.00

RAILROAD WROUGHT

Birmingham	8.00- 8.50
Boston, dealers	6.00- 6.50
Buffalo, No. 1	9.25- 9.75
Buffalo, No. 2	10.75-11.25
Chicago, No. 1, net	8.50- 9.00
Chicago, No. 2	9.75-10.25
Cincinnati, No. 2	7.50- 8.00
Eastern Pa.	10.50-11.00
N. Y., No. 1, deal.	7.25- 7.75
St. Louis, No. 1	6.50- 7.00
St. Louis, No. 2	8.25- 8.75

SPECIFICATION PIPE

Boston	3.00- 3.25
Eastern Pa.	9.00- 9.50
New York, dealers	3.50- 4.00

BUSHELING

Buffalo, No. 1	9.25- 9.75
Chicago, No. 1	8.50- 9.00
Cinci., No. 1, deal.	6.00- 6.50
Cincinnati, No. 2	3.00- 3.50
Cleveland, No. 2	6.00- 6.50
Detroit, No. 1, new	7.00- 7.50
Valleys, new, No. 1	10.50-11.00

MACHINE TURNINGS

Birmingham	3.50- 4.00
Boston, dealers	1.75- 2.00
Buffalo	4.50- 5.00
Chicago	5.00- 5.50
Cincinnati, dealers	3.50- 4.00
Cleveland	5.00- 5.50
Detroit	4.50- 5.00
Eastern Pa.	6.00- 6.50
New York, dealers	2.00- 2.25
Pittsburgh	8.00- 8.50
St. Louis	2.25- 2.75
Valleys	8.25- 8.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	3.25- 3.50
Buffalo	6.00- 6.50
Cincinnati, dealers	3.50- 4.00
Cleveland	6.00- 6.50
Detroit	4.75- 5.25
Eastern Pa.	5.00
New York, dealers	1.50- 1.75
Pittsburgh	6.50- 7.00

CAST IRON BORINGS

Birmingham, plain	3.50- 4.00
Boston, chemical	5.50- 6.50
Boston, dealers	3.25- 3.50
Buffalo	6.00- 6.50
Chicago	5.00- 5.50
Cincinnati, dealers	3.50- 4.00
Cleveland	6.50- 7.00
Detroit	4.75- 5.25
E. Pa., chemical	11.00-12.00
New York, dealers	1.50- 1.75
St. Louis	2.00- 2.50

PIPE AND FLUES

Cincinnati, dealers	5.00- 5.50

RAILROAD GRATE BARS

Buffalo	7.50- 8.00
Chicago, net	6.00- 6.50
Cincinnati	4.00- 4.50
Eastern Pa.	8.50
New York, dealers	4.00- 4.50
St. Louis	4.50- 5.00

FORGE FLASHINGS

Boston, dealers	4.50
Buffalo	9.25- 9.75
Cleveland	8.00- 8.50
Detroit	7.00- 7.50
Pittsburgh	10.00-10.50

FORGE SCRAP

Boston, dealers	4.50
Chicago, heavy	10.50-11.00
Eastern Pa.	9.50-10.00

ARCH BARS, TRANSOMS

St. Louis	10.00-10.50

AXLE TURNINGS

Boston, dealers	3.00- 3.50
Buffalo	7.50- 8.00
Chicago, elec. fur.	9.50-10.00
Cleveland	7.00- 7.50
Eastern Pa.	9.50
St. Louis	7.00- 7.50

STEEL CAR AXLES

Birmingham	12.00-12.50
Boston, ship. point.	10.00-10.50
Buffalo	12.50-13.00
Chicago, net	12.50-13.00
Eastern Pa.	16.00
St. Louis	12.00-12.50

SHAFTING

Boston, ship. point.	12.00-12.25
Eastern Pa.	17.50
New York, dealers	13.00-13.25
St. Louis	11.00-11.50

CAR WHEELS

Birmingham	9.00-10.00
Boston, iron deal.	5.25- 5.50
Buffalo, iron	11.00-11.50
Buffalo, steel	12.75-13.25
Chicago, iron	10.00-10.50
Chicago, rolled steel	10.75-11.25
Cincinnati, iron	8.00- 8.50
Eastern Pa., iron	11.00
Eastern Pa., steel	13.50
Pittsburgh, iron	12.00-12.50
Pittsburgh, steel	14.50-15.00
St. Louis, iron	8.00- 8.50
St. Louis, steel	10.75-11.25

NO. 1 CAST SCRAP

Birmingham	8.50- 9.50
Boston, No. 1 mach.	8.50- 9.00
Boston, No. 2	7.50- 8.00
Boston, tex. con.	8.50- 9.00
Buffalo, cupola	10.75-11.25
Buffalo, mach.	11.50-12.00
Chicago, agri. net	7.50- 8.00
Chicago, auto	9.00- 9.50
Chicago, mach. net	9.00- 9.50
Chicago, railr'd net	8.00- 8.50
Cinci., mach. cup.	8.50- 9.00
Cleveland, cupola	11.50-12.00
Detroit, net	9.50-10.00
Eastern Pa., cupola	11.00-12.00
E. Pa.,mixed yard	8.50- 9.50
Pittsburgh, cupola	13.50-14.00
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	8.00- 8.50
St. L., No. 1 mach.	9.00- 9.50

HEAVY CAST

Boston, del.	5.25- 5.50
Buffalo, break.	8.50- 9.00
Cleveland, break.	7.50- 8.00
Detroit, No. 1, mach. net	10.00-10.50
Detroit, break.	7.00- 7.50
Detroit, auto net	10.50-11.00
Eastern Pa.	10.50-11.00
N. Y., break. deal.	6.25- 6.50
Pittsburgh	11.50-12.00

MALLEABLE

Birmingham, R. R.	10.50-11.00
Boston, consum.	12.00-12.50
Buffalo	13.00-13.50
Chicago, R. R.	13.00-13.50
Cincinnati, agri. del.	8.50- 9.00
Cleveland, rail	12.00-12.50
Detroit, auto	10.00-10.50
St. Louis, R. R.	10.75-11.25
Eastern Pa., R. R.	11.00-11.50

RAILS FOR ROLLING

5 feet and over

Birmingham	10.50-11.00
Boston, dealers	8.00- 8.50
Buffalo	11.00-11.50
Chicago	10.50-11.00
Eastern Pa.	12.50-13.00
New York, dealer	7.50- 8.00
St. Louis	10.00-10.50

LOCOMOTIVE TIRES

Chicago (cut)	11.50-12.00
St. Louis, No. 1	9.00- 9.50

LOW PHOS. PUNCHINGS

Buffalo	12.50-13.00
Chicago	12.00-12.50
Eastern Pa.	13.00-14.00
Pittsburgh (heavy)	13.50-14.00
Pittsburgh (light)	13.00-13.50

Iron Ore

Lake Superior Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ores

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. low phos.	10.00
Swedish basic, 65%	9.00
Swedish low phos.	10.00
Spanish No. Africa basic, 50 to 60%	9.00
*Tungsten, spot, sh. ton unit, duty pd.	$15.50-16.00
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$18.00-19.50

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 52-55%	26.00
So. African, 52%	26.00
So. Afr., 49-51%	24.00
Indian, 58-60%	nominal
Indian, 48-50%	nominal

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore*	2.95c
Boston††	3.00c
Buffalo	3.00c
Chattanooga	3.31c
Chicago	2.95c
Cincinnati	3.17c
Cleveland	2.95c
Detroit	3.04c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.06c
New Orleans	3.30c
New York‡(d)	3.26c
Pittsburgh (h)	2.90c
Philadelphia*	2.93c
San Francisco	3.60c
Seattle	3.60c
St. Louis	3.19c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS

Portland	3.40c
Chattanooga	3.31c
Baltimore*	3.05c
Chicago	2.75c
Cincinnati	3.17c
New York‡(d)	3.36c
Philadelphia*	2.93c
St. Louis	3.19c
Tulsa	3.25c

REINFORCING BARS

Buffalo	2.60c
Chattanooga	3.31c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	2.45c
St. Louis	3.24c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

Baltimore*	3.00c
Boston††	3.19c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland	3.31c
Detroit	3.42c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.37c
Philadelphia*	2.98c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c

PLATES

Baltimore*	3.00c
Boston††	3.21c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland, ¼-in. and over	3.31c
Detroit	3.42c
Detroit, ⅜-in.	3.65 c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.40c
Philadelphia*	2.98c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE

Baltimore*	3.10c
Boston††	3.30c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.05c
Cincinnati	3.22c
Cleveland	3.11c
Det., 8-10 ga.	3.14c
Houston	3.35c
Los Angeles	3.70c
Milwaukee	3.16c
New Orleans	3.55c
New York	3.31c
Portland	3.75c
Philadelphia*	3.08c
Pittsburgh(h)	2.95c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.29c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK

Baltimore*†	3.60c
Boston (g)	3.95c
Buffalo	3.25c
Chattanooga	4.21c
Chicago	3.85c
Cincinnati	4.07c
Cleveland	3.91c
Detroit	3.94c
Los Angeles	4.35c
Milwaukee	3.96c
New York	3.89c
Philadelphia*†	3.60c
Pitts.** (h)	3.55c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	4.09c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GALV. SHEETS

Baltimore*†	4.30c
Buffalo	4.00c
Boston (g)	4.65c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.72c
Cleveland	4.61c
Detroit	4.72c
Houston	4.40c
Los Angeles	4.95c
Milwaukee	4.66c
New Orleans	4.50c
New York	4.50c
Philadelphia*†	4.30c
Pitts** (h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.79c
St. Paul	4.19c
Tulsa	5.10c

BANDS

Baltimore*	3.20c
Boston††	3.30c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.47c
Cleveland	3.36c
Detroit, ⅜-in. and lighter	3.39c
Houston	3.25c
Los Angeles	4.10c
Milwaukee	3.41c
New Orleans	3.95c
New York(d)	3.56c
Philadelphia	3.18c
Pittsburgh(h)	3.20c
Portland	4.25c
San Francisco	4.25c
Seattle	4.25c
St. Louis	3.54c
St. Paul	3.20c
Tulsa	3.45c

HOOPS

Baltimore	2.30c
Boston	4.30c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.47c
Det., No. 14 and lighter	3.39c
Los Angeles	5.85c
Milwaukee	3.41c
New York	3.56c
Philadelphia	3.43c
Pittsburgh(h)	3.70c
Portland	5.60c
San Francisco	6.15c
Seattle	5.60c
St. Louis	3.54c
St. Paul	3.75c

COLD FIN. STEEL

Baltimore (c)	3.58c
Boston	3.75c-3.90c
Buffalo (h)	3.40c
Chattanooga*	3.98c
Chicago (h)	3.35c
Cincinnati	3.57c
Cleveland (h)	3.35c
Detroit	3.49c
Los Ang.(f) (d)	5.85c
Milwaukee	3.46c
New Orleans	4.15c
New York	3.81c-4.31c
Philadelphia	3.61c
Pittsburgh	3.20c
Portland (f) (d)	6.00c
San Fran.(f) (d)	5.95c
Seattle (f) (d)	6.00c
St. Louis	3.59c
St. Paul	3.05c
Tulsa	4.50c

COLD ROLLED STRIP

Boston, 0.100-in., 500 lb. lots	5.35c
Buffalo	3.39c
Chicago	3.27c
Cincinnati (b)	3.44c
Cleveland (b)	3.20c
Detroit	3.33c
New York	3.36c
St. Louis	3.36c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up)

	Base
High speed	57c
High carbon, high chrome	37c
Oil hardening	22c
Special tool	20c
Extra tool	17c
Regular tool	14c

Uniform extras apply

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	70
Cleveland	70
Detroit	70–5
Milwaukee	70
Pittsburgh	70

(a) Under 100 pounds, 65 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Minus quant. diff.; (e) New mill classif.; (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less.

‡Domestic bars; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs., extras on less.

Prices on heavier lines are subject to new quantity differentials; 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs. and over, 35 cts. under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, July 3

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports	Continental Channel or North Sea ports, metric tons	
		Quoted in dollars at current value	**Quoted in gold pounds sterling
PIG IRON	£ s d		£ s d
Foundry, 2.50-3.00 Silicon	$15.47 3 2 6	$13.76	1 14 0
Basic bessemer	15.47 3 2 6*	12.95	1 12 0
Hematite, Phos. .03-.05	15.59 3 3 0	.....	.....
SEMIFINISHED STEEL			
Billets	$27.23 5 10 0	$19.02	2 7 0
Wire rods, No. 5 gage	42.08 8 10 0	36.44	4 10 0
FINISHED STEEL			
Standard rails	$38.36 7 15 0	$44.53	5 10 0
Merchant bars	1.66c 7 10 0	1.15c to 1.20c	3 2 6 to 3 5 0
Structural shapes	1.63c 7 7 6	1.14c	3 1 6
Plates, †¾ in. or 5 mm.	1.77c 8 0 0	1.51c	4 2 6
Sheets, black, 24 gage or 0.5 mm.	2.04c 9 5 0	2.13c	5 16 0††
Sheets, gal., 24 gage, corr.	2.44c 11 5 0	3.21c	8 15 0
Bands and strips	1.88c 8 10 0	1.46c	4 0 0
Plain wire, base	2.04c 9 5 0	1.96c	5 7 6
Galvanized wire, base	2.38c 10 15 0	2.29c to 2.33c	6 5 6 to 6 7 6
Wire nails, base	2.65c 12 0 0	2.11c	5 15 0
Tin plate, box 108 lbs.	$4.46 0 18 2	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$16.71	3 7 6(a)	$17.26	260	$12.51	370	$25.51	63
Basic bessemer pig iron	17.33	3 10 0(a)*	12.28	185	11.15	330	28.15	69.50†
Furnace coke	4.08	0 16 6	7.97	120	3.72	110	7.70	19
Billets	27.23	5 10 0	28.55	430	18.25	540	39.08	96.50
Standard rails	1.82c	8 5 0	2.08c	694	1.65c	1,100	2.43c	132
Merchant bars	1.90c	8 12 0	1.68c	560	.90c	600	2.02c	110
Structural shapes	1.93c	8 15 0	1.65c	550	.90c	600	1.98c	107.50
Plates, †¼-in. or 5 mm.	2.00c	9 1 3	2.10c	700	1.05c	700	2.34c	127
Sheets, black	2.32c	10 10 0§	1.86c	620‡	1.24c	825‡	2.65c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.87c	13 0 0	3.81c	1,270	2.25c	1,500	6.81c	370
Plain wire	2.04c	9 5 0	3.39c	1,130	1.73c	1,150	3.18c	173
Bands and strips	2.07c	9 7 0	1.95c	650	1.26c	840	2.34c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel a del. Middlesbrough. b hematite. ††Close annealed

**Gold pound sterling carries a premium of 66.22 per cent over paper sterling.

—The Market Week—

Bars

Bar Prices, Page 66

Pittsburgh—Buying of soft steel bars through last week did not decline as much as had been anticipated, and specifications for the first three days averaged slightly more than the first three business days in June. Forging shops appear more active, and requirements of the farm implement trade are sustained. Carbon steel bars remain at 1.80c, base, Pittsburgh, and alloy bars, 2.45c, base, Pittsburgh.

Cleveland—Cleveland steel bar mills went down at the close of July 3 for the remainder of the week, but will resume this week at about 40 per cent. Miscellaneous orders continue in fairly good volume. Specifications also are beginning to come in from automobile forgers and partsmakers for new models, while agricultural implement manufacturers are buying moderate tonnages regularly. Prices are firm.

Chicago—Steel bar demand is steady though small lots usually prevail. Needs of miscellaneous users have declined little the past few weeks, and requirements of farm implement manufacturers are holding well. While automotive demand is off markedly from the rate of a few months ago, no additional recession is noted. Steady prices have not influenced consumers to order far ahead.

Boston—Hand-to-hand buying of commercial steel, alloy and forging bars continues, with prices unchanged and untested by quantity inquiry. Demand is well distributed. Total volume is small, but steady.

New York—A rebound in bar tonnage is expected this week, following several days of inactivity, as a result of the July 4 holiday, but business will probably be restricted by seasonal influences, the trade believes. At the moment, at least, little outstanding inquiry is noted, although cold-finished bar specifications from certain machine tool builders promise to be attractive for some time. Early award of the quarterly requirements of the New York Central, on which bids were opened July 2, is expected. Commercial bars are unchanged at 1.80c, Pittsburgh, or 2.11c, New York.

Philadelphia—Machine tool and agricultural equipment specifications are lending the principal support to the steel bar market although business on the whole is on a restricted basis. Railroad and bolt and nut manufacturers are buying little.

Bethlehem Steel Co., Bethlehem, Pa., has been awarded 10,000 feet of annealed tungsten chromium steel

ANNOUNCING

A new highly-efficient insulating fire brick for **DIRECT EXPOSURE** *up to 2600° F.*

HERE'S the latest development in light-weight, semi-refractory brick! The new Armstrong's EF-26 will not crack, fuse, or spall at temperatures as high as 2600° F. And it offers all the operating advantages which have made Armstrong's EF Brick the choice of leading furnace builders and plant supervisors.

For Armstrong's EF-26 requires no fire brick protection, except when exposed to the direct impingement of the flame or slagging action. This permits the use of thinner walls, with a consequent sharper furnace, shorter heating time, speedier production line, and a real saving on fuel cost.

Armstrong's EF-26 is suitable for all types of furnaces—gas, oil, coal, or electric-operated. It is especially well suited for bright annealing furnaces since it contains no free iron to combine with the gases usually introduced into this type of furnace. The standard brick (9" x 4½" x 2½") weighs three pounds, and has a crushing strength (cold) of 450 lbs. per square inch, 545 lbs. at 1800° F., 265 lbs. at 2100° F., and 125 lbs. at 2500° F.

For samples and further information about Armstrong's EF-26—or about any of Armstrong's other brick—write to Armstrong Cork Products Co., Building Materials Division, 985 Concord Street, Lancaster, Penna.

IMPORTANT!

New, simplified markings of other brick in Armstrong's complete line

ARMSTRONG'S N-16 (formerly designated *Nonpareil 1600*) a light-weight insulating brick for temperatures up to 1600° F. behind the refractory.

ARMSTRONG'S A-25 (formerly designated *Armstrong 2500*) the standard insulating brick for temperatures up to 2500° F. behind the refractory.

ARMSTRONG'S EF-22 (formerly designated *EF*) an insulating fire brick for direct exposure up to 2200° F.

Armstrong's

HIGH TEMPERATURE INSULATION

at 19 cents a pound delivered at the Frankford arsenal, Frankford, Pa. Wyckoff Steel Co. booked 240,000 feet of core steel for the same point at 3.085 cents per pound delivered. Bids on this material closed June 11, the contracts being awarded last week.

Youngstown, O.—Important producers report that, while April steel bar orders fell off June shipments are better than May; receipts of specifications this early in July indicate that the current month will be likely to equal June, if not exceed it. Requirements for bars are coming from a wide variety of miscellaneous sources in addition to road builders and concrete bar consumers. Quotations continue firm for the various forms of steel bars.

Cold Finished

Cold Finished Prices, Page 67

Pittsburgh—The 1.95c, Pittsburgh, base, on carbon cold-drawn steel bars is still firm, but demand is dwindling and no impetus is expected this month. Cold-finished steel bar specifications in June were only slightly under those in May, but producers' backlogs have been reduced considerably, compared with a month ago. Farm implement buyers are still active, but automobile makers are ordering cold-finished steel bars cautiously.

Plates

Plate Prices, Page 66

Pittsburgh — McClintic-Marshall Corp., Bethlehem, Pa., is low at $15,594.42 for furnishing fittings for 28-inch inside diameter discharge pipe for Fort Peck, Mont., dam dredges. This work consists of 24 cast steel valves of ½-inch plate inlet and outlet connections; 24 wyes of ½-inch plate, 24 20-degree elbows of ½-inch plate, 12 40-degree elbows of ½-inch plate, and 168 28-inch land pipe connection links. Alabama Drydock & Shipbuilding Co. is low on two barges for the Mobile, Ala., engineers on recent bids. Dravo Contracting Co. has completed shipment on six 110 x 26-foot steel barges for the Tennessee valley authority, contract for which was taken in May at the price of $8440 each. American Oil Co., Baltimore, has set July 15 for the closing of bids on four 192 x 35 x 9-foot steel oil barges, which will require 1200 tons of steel plates.

Cleveland—Plate prices quoted by five producers on railroad and other substantial requirements here during the week showed no deviation from the established market base. In one instance a lower quotation submitted by a seller was explained as due to a misunderstanding of the specification. It was withdrawn, and the full price submitted. Actual purchases are relatively light. Plate production here was suspended on July 3 for the remainder of the week.

Chicago—Inquiries for industrial tank work are heavier, but awards lately have been confined to miscellaneous small lots. Increased business for larger projects is looked for later this quarter. Plate demand from miscellaneous sources is steady but quiet. Prices are firm.

Boston—Nine tanks for fuel oil storage at Chelsea, Mass., are active. Buying is largely for miscellaneous needs and is not heavy, although the outlook for shipyard needs is promising.

New York—Some improvement in plate tonnage is expected, following the holiday lull. However, there are few moderate tonnages that may be regarded as definitely active and sellers, consequently, look for a rather dull July. Tank fabrication is negligible. Prices are unchanged

Behind the Scenes with STEEL

Time Limps On!

Browsing about the spacious confines of the Penton library the other day we came across the time-hallowed volumes of STEEL's forebear, *Iron Trade Review*, vintage 1885. What did magazines talk about 50 years ago? Listen to this report of the American Iron and Steel Association (now the American Iron and Steel institute) from the cobwebby columns of the July 11, 1885, issue:

"The close of the first half of the year 1885 finds the depression in business deeper than at its beginning, both in our own country and in Europe. . . . it cannot be denied that we are falling, if we have not already fallen, into a condition which is most expressively described by the phrase 'hard times.'

"The real trouble with this country is that we have been spinning along at entirely too rapid a rate for our own good. We should have learned this lesson when we were brought to a sudden halt in 1873 and again in 1883. The civil war made money plenty and an abundance of money,

joined to the general rebound from depression to exaltation after the war closed, unduly stimulated all the industries of the country. We made free use of labor-saving machinery and of all new manufacturing methods.

". . . immigration greatly increased, and this gave us a surplus of labor in manufacturing and mining centres, and a surplus of farmers along the Western railroads. With the aid of modern machinery we could produce more than we could consume and more than we could sell abroad. Hence low wages through overcrowding and low prices through overproduction. . . .

"We are naturally a go-ahead people . . . it (the war) made us prodigal and reckless.

"Relief will come to this country as soon as a great war . . . or some other extraordinary event creates a sudden demand for some staple product that is not in excessive supply. Then confidence will return, and hoarded money will be put to good uses. No man can predict when good times will come . . . but that they will come suddenly in this country there can be no doubt."

How times don't change! Some of the identical phrasing can probably be found on the editorial pages of those papers you have there on your desk.

* * *

Contest Hounds Notice

Several readers (well, at least one) have asked us the meaning of our signature—SHRDLU. Of course, we could tell them in a flash that it is just a nom de plume comprising the letters of six keys in one row of a linotype machine, but that doesn't help much.

So, after many hours of pencil work we evolved the following:

STEEL Has Readability, Dependability, Lucidity, Utility.

But that isn't much account. Among the great masses making up our weekly audience there undoubtedly are many top-notch idea men who could make something really unusual from this combination of letters. So what, you say? So, just for the helluvit we hereby offer one new crisp five-dollar bill for the best interpretation sent in.

Judges decisions final, duplicate awards for ties and all the rest of the usual contest hokum are hereby dispensed with. Let's hear from you! Contest closes Aug. 1.

* * *

Wise Guy No. 1

Well, it's started. We inadvertently mentioned this contest to one of our more imaginative editors and he immediately went into action. His first (and we hope last) contribution at least shows the possibilities of the thing. We blush to repeat it but so long as it's among men, here it is:

She Has Real Dainty Lace Underwear!

* * *

Road to Recovery

To readers of the *Cleveland Plain Dealer* it would appear that people can once more afford to get sick. Side by side on last Sunday's financial page headlines told of an improved six months on the business front and of the gain in patients reported by local hospitals. Busier than in years, said the officials.

We've had a good case of the jitters for months now so maybe if the boss comes through with that raise we can really afford something worthwhile like a nice case of locomotor ataxia.

—SHRDLU

at 1.90c, Coatesville, or 2.09c, New York. Cornell Contracting Corp., 405 Lexington avenue, New York, has been awarded the general contract for construction of the New York approach to the Midtown tunnel, and will place 910 tons of steel tunnel lining.

Philadelphia—Plate tonnage is spotty with little appearing for the immediate future aside from some prospective ship work. Prices are steady.

San Francisco—There are practically no inquiries for projects involving 100 tons or more plates. The city of San Diego, Calif., has been granted a loan of over $200,000 for an extension to the El Capitan pipe line, requiring 4000 tons. Bids, it is expected, will be called soon.

Contracts Placed

2225 tons, storage tanks, Shell Petroleum Corp., Houston, Tex., to Petroleum Iron Works, Sharon, Pa.

250 tons, 36-inch welded pipe, Ballard trunk sewer, Seattle, to unnamed interest.

193 tons, cold-rolled sheet steel, schedule 5245, Mare Island navy yard, California, to unnamed interest.

130 tons, 12 fermenters, U. S. Industrial Alcohol Co., Newark, N. J., to Buffalo Tank Co., Staten Island, N. Y.

Contracts Pending

4000 tons, El Capitan pipe line extension, San Diego, Calif.; city has been granted loan and bids soon.

1200 tons, four 192 x 35 x 9-foot steel oil barges, each of 8000-barrel capacity, for American Oil Co., Baltimore, for rivers of the Pittsburgh district; bids to be opened July 15.

225 tons, bureau of supplies and accounts, navy department, Washington, 12 bidders quoted 2.23c, delivered, on 150 tons for Portsmouth, N. H.; on 75 tons for Mare Island, Calif., three of 12 bidders quoted 2.35c, delivered; bids June 25, schedule 5347.

Sheets

Sheet Prices, Page 66

Pittsburgh — Specifications for sheets, mainly miscellaneous, were in better volume early last week. New buying is in hot-rolled grades, as the cold-rolled sheet market has undergone a considerable decline in specifications. Last week an advancing rate of operations in the sheet mills was arrested by the general observance of the holiday, but early advances are confidently expected. Prices are firm.

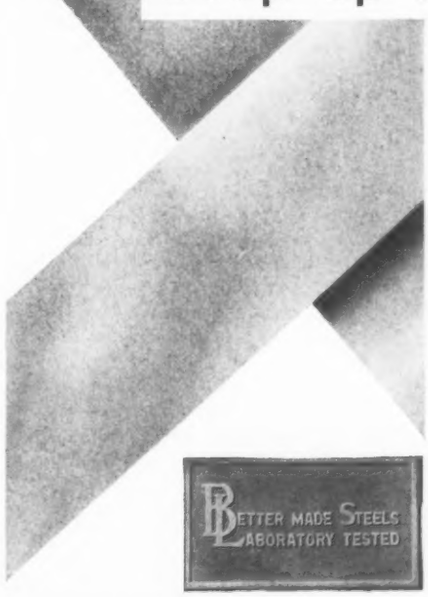
Cleveland — Light demand for sheets and the holiday combined to depress production. The Cleveland sheet mill suspended July 3 for the remainder of the week, while a nearby lake sheet mill was idle all week. Automobile manufacturers have specified practically all the material they require for completion of present models, and small releases for new models are beginning to filter through. Sheet producers expect some substantial purchases from these sources this month. Volume from other consumers is down considerably from the June average.

Chicago — Sheet business was quieter the past week, due principally to the holiday influence, though the month as a whole is expected to represent the low period for the year. Renewed buying by the automotive industry and other consumers is looked for by mid-August. Prices are firm.

Boston—Sheet demand is slower with industrial consumers buying as needed. Trade with jobbers has generally been slow, reflecting cautious purchasing by warehouses.

New York—Although some rebound is expected this week, following the holiday let-down, sheet sellers now look for possibly several weeks of restricted business during the summer vacation period. Consumers have little stock on hand, but

Step up PRODUCTION



WHY waste time working ordinary sheared plates into usable shape when you can buy B & L Extra Wide Flats already machined smooth and *cold-sawed* to accurate dimensions!

These handy sections are available in widths up to 12" and in thickness from ¼" to 2"—just the thing for bed plates, stripper plates, backing plates for dies, patterns, jigs, fixtures and equipment parts.

Nothing like them for saving assembly time, reducing machining costs and eliminating excess scrap. Easy to work to precision standards in fabricating your product, as they are *cold drawn* to uniform section, true flatness and size tolerances of plus .000" to minus .008"—and free from surface blemish.

An increasing number of steel users are adopting B & L Extra Wide Flats to simplify their manufacturing operations. Why not try these bar shapes in your shop?

Cold Finished Bars and Shafting ● Ultra-Cut Steel ● Special Sections ● Alloy Steels

BLISS & LAUGHLIN, INC.

HARVEY, ILL. *Sales Offices in all Principal Cities* **BUFFALO, N.Y.**

prospects are that their requirements will be lighter for a while.

Republic Steel Corp. has been awarded 6300 pounds of corrosion-resisting steel sheets for delivery at Brooklyn, N. Y., and Charleston, S. C., at $3379.45, bids June 4.

Philadelphia—Although improvement in sheet specifications is expected this week, following the holiday, a light volume is anticipated over the next few weeks. Prices are unchanged.

Buffalo—Buffalo sheet mills shut down July 4 for five days or longer. It was the first cessation of output for this length of time since the Christmas holidays. General sheet inquiry is of sufficient proportions to indicate that production early in the third quarter will be around 60 per cent.

Youngstown, O.—Due to hot weather mill managers closed down most sheet mills throughout the entire holiday week. Specifications in hand promise a continued fair rate of mill operations during the remainder of this month. Most of the currently rolled flat rolled material has been bought in small lots, while buyers were uncertain over the possible price situation as an outgrowth of the code invalidation. However, this appears to be passing since orders individually are increasing in tonnage.

Cincinnati—Demand for sheets in this district was sustained during the past week at seasonally normal levels, with the downward trend offset by galvanized, specifications in this grade being close to mill capacity. Rumors that mills in this district were considering stamping departments have subsided.

St. Louis—Further recessionary trends are noted in the sheet market. Carlot orders are less frequent than a month ago.

Birmingham, Ala.—Demand is not as strong as it was in June. Prospects are deemed bright, with agricultural and other interests anticipating needs.

Pipe

Pipe Prices, Page 67

Pittsburgh—Further details on the 162-mile natural gas pipe line for New York Oil Co., Denver, disclose about 100 miles of the line will be used pipe supplied by a Denver concern which has taken over the contract to purchase the pipe requirements for Williams Bros., Tulsa, Okla., general contractor. Virtually the only new pipe needed is 60 miles of 12 inch, the balance of 10, 8, 6 and 3½-inch to be largely reclaimed from a line which National Tube Co. furnished some years ago for the Sinclair Oil Co. line into Teapot Dome, Wyo. An interesting detail on the purchase of the 60 miles of 12-inch pipe concerns the stipulation that the successful pipe supplier take in return about 4000 tons of scrap which the Denver steel buyer has on hand. Most steel pipe makers are uncertain over accepting this offer. Prospects for an order for 300 miles of 22 or 24-inch diameter line pipe are held favorable in the extension of the Panhandle Eastern Pipe Line Co.'s eastern line terminus near Muncie, Ind., into Detroit.

Chicago—While cast pipe inquiries are slightly heavier, orders continue slow and no important lots have been booked recently. Shipments against old contracts are less active and deliveries of some tonnages are deferred by delays in completing financing. The largest of new inquiries is 1595 tons of 6 to 16-inch pipe for Chicago.

Requirements for the water supply system at Forth Smith, Ark., involving 5000 tons of 27-inch steel pipe, have been placed with Taylor Forge & Pipe Works, Chicago, through the general contractor, Williams Bros., Tulsa, Okla. The work also will take 310 tons of reinforcing bars and 2600 tons of cast pipe.

Boston—Still in small lots, buying and inquiry in cast pipe continue below expectations. Merchant steel pipe is less active while wrought iron pipe buying is light.

New York—Award of 5000 tons of cast pipe, 6 to 20-inch, cement-lined, for yard stocks, is being made by New York city this week. United States Pipe & Foundry Co. is low on the bulk of the tonnage, 3000 tons, while R. D. Wood & Co. and Donaldson Iron Works are low on the remainder. This purchase is the largest made in the district in months. Prices on the material were fairly well maintained. A large volume of fittings is also being placed. Except for this business, buying is light. Sinclair Refining Co. is figuring tentatively on approximately 1000 tons of 6⅝-inch steel pipe, although used pipe of their own eventually may be decided upon.

Buffalo—An order for more than 2500 tons of pipe for a gas line in the southern tier counties section of New York has been placed and several other fair inquiries are pending.

Youngstown, O.—While orders for line pipe are few and mainly for small individual lots, demand continues to increase for oil country goods. Drilling is being resumed in the Southwest and is expected to continue to gain. Jobbers also have added to their stocks of merchant pipe ed to their stocks of merchant pipe.

Birmingham, Ala.—Anticipated business has not been realized and pipe shop operations continue unchanged from the past several weeks.

Philadelphia—It is reported 250 tons of wrought pipe may be purchased for use in an addition to the Library of Congress building.

San Francisco—Demand for cast pipe has fallen off during the past week and few inquiries of importance are pending. Bids have just been opened on from 1500 to 3500 tons of 60-inch pipe for the White Point outfall sewer, Los Angeles. Awards in the far western states during the first half of the year aggregated 21,971 tons as compared with 23,911 tons for the corresponding period in 1934.

Seattle—Demand is improving slowly in the Pacific Northwest. Municipalities are hoping for federal assistance. Those which are in the market are working on limited appropriations, which is increasing competition between various types of pipe.

Cast Pipe Placed

181 tons, 4-inch, Garden City, Utah, to Pacific States Cast Iron Pipe Co., Provo, Utah.

118 tons, 4 to 8-inch, class 150, Inglewood, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

110 tons, 6 and 10-inch, Chelsea, Mass., to United States Pipe & Foundry Co., Burlington, N. J.

Cast Pipe Pending

5000 tons, 6 to 20-inch, cement lined, New York city yard stocks for delivery to all five boroughs, United States Pipe & Foundry Co., Burlington, N. J., low on 3000 tons; R. D. Wood & Co., Florence, N. J., low on 1400 tons, and Donaldson Iron Works, Emaus, Pa., low on 600 tons.

3500 tons, 60-inch, outfall sewer, Los Angeles; bids in.

1595 tons, 6, 8, 12 and 16-inch, class B pipe, Chicago; bids to commissioner of public works, July 16.

210 tons, 20-inch, outfall sewer, San Mateo, Calif.; general contract awarded.

175 tons, 6 and 10-inch, also accessories, Omak, Wash.; bids in.

Steel Pipe Placed

5000 tons, 27-inch, water supply system, Fort Smith, Ark., to Taylor Forge & Pipe Works, Chicago, through Williams Bros., Tulsa, Okla., general contractor (award noted last week).

Steel Pipe Pending

9000 tons, approximately, 10-inch, 85-mile welded pipeline from Stamfordyce fields to Port Isabel and Brownsville, Tex.; general contract, involving $400,000, from Cortez Oil Co., Fort Worth, Tex., to Hope Engineering Co., Mt. Vernon, O.

1000 tons, 6⅝-inch steel pipe, Sinclair Refining Co., New York, tentatively contemplated.

138 tons, Jacksonville, Oreg.; Consolidated Supply Co., Portland, low.

100 tons, Prairie City, Oreg.; Eugene Ruedy, Portland, low.

Transportation

Track Material Prices, Page 67

Closing on 500 subway cars by the board of transportation, New York, is the most important event in the transportation market. Half went to the American Car & Foundry Co., New York, to be built at Berwick, Pa. The other 250 were awarded to the Pressed Steel Car Co., Pittsburgh, which will build 100 at its shops at McKees Rocks, Pa. The remaining 150 have been allocated to the Pullman-Standard Car Mfg. Co., Chicago, for construction at its shops at Butler, Pa. Cost of the cars is about $19,226,800.

Domestic freight car awards for June total 5151, award of 24 by the Ethyl Gasoline Co., New York, at the end of the month bringing the total higher than had been estimated. For six months total awards are 6333. Comparisons follow:

	1935	1934	1933	1932
Jan.	24	152	3	159
Feb.	806	19,725	0	35
March	0	30	5	105
April	350	800	50	0
May	2	717	8	60
June	5,151	1,835	500	0
6 Mo.	6,333	23,259	566	419
July		19	306	25
Aug.		105	202	5
Sept.		7	23	1,298
Oct.		75	514	0
Nov.		254	533	2
Dec.		110	316	50
Total		23,829	2,460	1,739

Chicago, Burlington & Quincy has under consideration building of 250 freight cars in addition to those now under way, in its own shops.

New York, New Haven & Hartford closes bids July 10 on 1000 kegs of track spikes.

Seaboard Air Line will open bids July 13 on 200,000 tie plates and 2800 kegs of track spikes.

Car Orders Placed

Board of Transportation, New York, 500 subway cars for Eighth avenue system; 250 to American Car & Foundry Co., New York; 250 to Pressed Steel Car Co., Pittsburgh, of which 150 will be allocated by the latter to Pullman-Standard Car & Mfg. Co., Chicago, for construction at its shops at Butler, Pa.

Ethyl Gasoline Corp., New York, fifteen 3000-gallon tank cars and nine 6000-gallon tank cars, to American Car & Foundry Co., 30 Church street, New York.

Buses Booked

American Car & Foundry Motors Co., New York: Thirty city coaches for Capital Transit Co., Washington; three city coaches for Worcester Street Railway Co., Worcester, Mass.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 67

Nut and bolt shipments in June were 25 per cent below the volume in May, for the industry. At Cleveland demand is more diversified. Specifications continue to be received from automobile manufacturers for present models. Ford is tapering; Chevrolet requirements are steady. The farm implement industry shows no slackening in operations and is counted on to take as much tonnage this month as during June. Railroads recently have been more active buyers for track work and equipment repairs. The market for wrought washers has been continued at $6.25 off list. While sales lately have declined moderately, demand continues heavier than a year ago, and the third quarter outlook is regarded as favorable.

Which Type Of PERMITE Aluminum Alloy Casting *Best Fills Your Specific Needs?*

All Permite Aluminum Alloy Castings bring a new lightness of weight, improvement in appearance and increase in efficiency to the products in which they are used. But each type is adaptable to a specific need.

PERMANENT MOLD — Permite Permanent Mold Castings are the most reliable from the standpoint of uniformity, fine grain structure and dimensional accuracy. Close dimensional accuracy eliminates the necessity of machine finishing on some surfaces, and reduces it to a minimum on others—thereby drastically lowering machining costs.

SEMI-PERMANENT MOLD — Permite Semi-Permanent Mold Castings are used where the interior of the casting is of such intricate design as to prevent the removal of metal cores. The exterior of this casting is made in a metal mold, giving to the surface the same exceptional qualities as possessed by the Permanent Mold Casting.

SAND CAST — Sand Castings are used where small quantities are required, permitting only a minimum pattern charge, or where maximum strength and soundness are not required. In many cases, they form the first step in experiments, later to be converted into semi-permanent or full permanent mold castings.

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1949

Shapes

Structural Shape Prices, Page 66

New York — McClintic-Marshall Corp. will fabricate close to 9000 tons for the Bronx approach, Triboro bridge, New York. This contract practically cleans up structural requirements for this project, one remaining contract taking a small tonnage at the Randall Island junction to the Manhattan spur. Except for this award, structural contracts are light and new inquiry sluggish. More small postoffices, however, are due to be closed later this month.

Cleveland—Nickel Plate railroad has awarded 925 tons for a bridge at the New York-Pennsylvania state line to McClintic-Marshall Corp., this being the largest award here in the week. Ingalls Iron Works Co., Verona, Pa., is low bidder on 320 tons for a building for the Western Automatic Machine Screw Co., Elyria, O.

Pittsburgh—Rust Engineering Co., Pittsburgh, is purchasing 430 tons of structural steel for the new Pennsylvania railroad pier docks at Erie, Pa. Otherwise, structural inquiry is declining. Structural shapes are 1.80c, base, Pittsburgh, but fabricated prices continue irregular.

Chicago—Identical bids were received on 5000 tons of piling for the TVA Pickwick dam, but this material has yet to be placed. Structural awards are few, headed by 1600 tons for an addition for Briggs Mfg. Co., Detroit. A similar tonnage will be required for a brewery storage building in the same city.

Boston—Structural steel demand is sluggish. Awards include 195 tons for a mill building addition at Providence, R. I., but the total volume is light.

Philadelphia—Featuring the structural market is an inquiry for 2600 tons of steel piling for a jetty at Wilmington, Del., on which the United States engineer, Philadelphia, will open bids July 22. An inquiry for 10,000 tons for a federal reserve building, Washington, is expected out late this summer.

Seattle—Interest is centering on opening of bids at Portland, Oreg., July 10, for about 8000 tons of shapes for gates, cranes and other items for the Bonneville, Oreg., dam, and on July 22 for more than 2500 tons of structurals and reinforcing for the Seminole dam, Wyoming.

San Francisco—The largest structural project on the Pacific coast, so far this year, has just come out for

Shape Awards Compared

	Tons
Week ended July 6	**20,907**
Week ended June 29	**21,342**
Week ended June 22	**32,891**
This week, 1934	**12,430**
Weekly average, 1934	**16,284**
Weekly average, 1935	**14,577**
Weekly average, June	**16,473**
Total to date, 1934	**476,147**
Total to date, 1935	**408,173**

Bids on 9000-ton Bronx Bridge Itemized

Unit bids, steel work, Bronx approach, Triboro bridge, New York, approximately 9000 tons, awarded to McClintic-Marshall Corp., opening June 27

	3,300,000 lbs. silicon steel, Piers 61N to 64N.	4,100,000 lbs. carbon steel, Piers 61N to 64N.	4,300,000 lbs. silicon steel, Piers 64N to 68N.	6,200,000 lbs. carbon steel, Piers 64N to 68N.	140,000 lbs. cast steel.
McClintic-Marshall Corp.	$0.0628	$0.0560	$0.0614	$0.0540	$0.1379
Taylor-Fichter Steel Constr. Co. Inc.	.0640	.0540	.0680	.0610	.1000
Harris Structural Steel Co. Inc.	.0681	.0597	.0675	.0580	.1000
The Phoenix Bridge Co.	.0679	.0628	.0638	.0575	.1644
American Bridge Co. Inc.	.0694	.0615	.0649	.0579	.1815

	80,000 lbs. special cast steel.	150,000 lbs. wrought, cast and malleable iron, cast steel and carbon steel used in drainage system and railings.	3,200 lbs. copper and aluminum.	Asphalt plank pavement for the lump sum — not estimated.	Estimated total contract price.
McClintic-Marshall Corp.	$0.1025	$0.1437	$0.6350	$7,000	$1,093,753.00
Taylor-Fichter Steel Constr. Co. Inc.	.1500	.1640	.9000	7,000	1,163,680.00
Harris Structural Steel Co. Inc.	.1000	.1500	.6000	7,250	1,173,020.00
The Phoenix Bridge Co.	.1000	.1410	.7500	9,144	1,176,100.00
American Bridge Co. Inc.	.1312	.1410	.5830	7,100	1,185,241.60

figures, to be opened on Aug. 20, and calls for from 12,000 to 15,000 tons for transmissoin towers for the metropolitan water district, Los Angeles. In connection with this, bids will also be taken on 2800 tons of conductor wire, involving 3,834,000 feet of copper wire, or 3,668,000 feet of steel reinforced aluminum wire. Recent bookings were not very heavy.

Shape Contracts Placed

8950 tons, Bronx approach, Triboro bridge, New York, to Mclintic-Marshall Corp., Bethlehem, Pa.

2150 tons, building for Union Bag & Paper Co., Savannah, Ga., to Jones & Laughlin Steel Corp.; through Merritt-Chapman & Scott Inc., New York.

1675 tons, factory addition, Briggs Mfg. Co., Detroit, to Whitehead & Kales Co., Detroit.

1160 tons, foundry building, Kelsey-Hayes Wheel Corp., Detroit, to Wisconsin Bridge Co., Milwaukee.

960 tons, Norris power plant, Tennessee valley authority, Coal Creek, Tenn., to Virginia Bridge & Iron Co., Roanoke, Va.

925 tons, bridge, Nickel Plate railroad, Cleveland, at New York-Pennsylvania state line, to McClintic-Marshall Corp., Bethlehem, Pa.

700 tons, cement silos, Coulee, Wash., dam project, to unnamed eastern interests.

575 tons, bridge, Verdigris, Okla., to J. B. Klein Iron & Foundry Co., Oklahoma City, Okla.

400 tons, plant addiion, Chevrolet Motor Co., Bay City, Mich., to R. C. Mahon Co., Detroit.

380 tons, nurses home, Seaview hospital, Staten Island, New York, to Ingalls Iron Works Co., Birmingham, Ala.; Rosoff Bros. Inc., New York, general contractor.

325 tons, bridge, Yazoo river, Yazoo City, Miss., to Nashville Bridge Co., Nashville, Tenn.

305 tons, lintels, Cedar-Central housing project, Cleveland, to Truscon Steel Co., Youngstown, O.

300 tons, state highway bridge, Hallowell, Me., to American Bridge Co., Pittsburgh.

270 tons, pier reconstruction, Triboro bridge, New York, contract No. 30, to Post & McCord Inc., New York; through Godwin Construction Co.

260 tons, factory building, East Liverpool, O., to Truscon Steel Co., Youngstown, O.

240 tons, high school, Manhasset, Long Island, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.

195 tons, mill building addition, Providence, R. I., to New England Structural Co., Everett, Mass.; A. F. Smiley Construction Co., Inc., Pawtucket, R. I., general contractor.

165 tons, coal pocket, Chicago, Burlington & Quincy railroad, East St. Louis, Ill., to Stupp Bros. Bridge & Iron Co., St. Louis.

165 tons, storage building, Houston, Tex., to Mosher Steel & Machinery Co., Houston.

165 tons, loading dock, Chrysler Motor Corp., Detroit, to Whitehead & Kales Co., Detroit.

157 tons, two state bridges, Monterey county, California, to unnamed interest.

150 tons, bridge, Jupiter, Fla., for Florida East Coast railroad, to McClintic-Marshall Corp., Bethlehem, Pa.

130 tons, infirmary building, South Bend, Ind., to Edwards Iron Works, South Bend.

105 tons, beam bridge, Macon county, Illinois, to Mississippi Valley Structural Steel Co., Decatur, Ill.

100 tons, building, Beneficial Loan society, Wilmington, Del., to McClintic-Marshall Corp., Bethlehem, Pa.

Shape Contracts Pending

12,000 to 15,000 tons, transmission towers, metropolitan water district, Los Angeles; bids Aug. 20.

10,000 tons, department of interior building, Washington; bids July 19.

8000 tons, building, Viscose Co., Meadville, Pa.; general contract to Wark Co., Philadelphia.

5301 tons, steel sheet piling, levee wall, Monroe and West Monroe, La.; bids July 18, United States engineer, Vicksburg, Miss. In addition to bars noted on another page this project takes approximately 125 tons of anchor channels and miscellaneous steel, 10,470 feet of steel pipe, 12,160 linear feet, steel tie bars, and about 30 tons of wrought iron.

2500 tons, New York tunnel approach and plaza, Manhattan-Weehawken, N. J., Hudson river tunnel, Cornell Contracting Corp., New York, awarded general contract. Project also requires 910 tons of steel tunnel lining, 50,000 pounds of mesh, approximately 150 tons of steel, wrought and cast iron pipe and galvanized steel conduits.

2500 tons, building for eleventh naval district, San Diego, Calif.; bids soon.

1600 tons, storage building, Stroh Brewing Co., Detroit.

850 tons, Monrovia No. 4 and San Rafael No. 1 and 2 tunnels for metropolitan water district, Los Angeles; bids for placing July 23.

520 tons, plant addition, Detroit, for Chrysler Corp.

430 tons, Pennsylvania railroad docks, Erie, Pa.; Rust Engineering Co., Pittsburgh, genefal contractor. Steel bids received.

400 tons, Northern Illinois Coal Corp., Wilmington, Ill.

320 tons, building, Western Automatic Machine Screw Co., Elyria, O.; Ingalls Iron Works Co., Verona, Pa., low bidder.

275 tons, state bridge, Idaho.

250 tons, building for Guenther Brewing Co., Baltimore.

210 tons, school alterations, West Roxbury, Boston, Mass.

210 tons, state highway bridge, Elliott county, Kentucky.

193 tons, Hassayampa river bridge, Maricopa county, Arizona, for state; Wisconsin Bridge & Iron Co., low.

140 tons, telephone building, Walla Walla, Wash.; specifications by C. E. Rogers, company engineer, Seattle.

Unstated, 260-foot bridge superstructure, Custer county, Idaho; bids to bureau of roads, Ogden, Utah, July 11.

United States Rubber Products Inc., mechanical goods division, 1790 Broadway, New York, has moved its New Orleans branch from 202 Fulton street to 440 Canal street.

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Reinforcing

Reinforcing Bar Prices, Page 67

New York—Except for 850 tons for a sewer, Queens, New York, reinforcing bar buying is light. The largest pending job in the district, 1388 tons for the New York approach to the Weehawken, N. J., Hudson river tunnel will probably be bought this week. Steel will be used for tunnel lining instead of cast iron, taking 910 tons on which the general contractor quoted $160 per ton in place.

Pittsburgh—The first Pennsylvania state highway letting since prior to November, 1934, has been advertised for July 19. This includes only one small reinforced concrete pavement project in Coplay borough, Lehigh county. Closing date for bids on the Liberty tubes plaza, Pittsburgh, is expected to be announced soon, with this contract to be split up into six separate contracts. In all, the project requires 900 to 1000 tons of new billet steel bars. New billet steel bars in carload quantities remain 2.05c, base, Pittsburgh, for cut lengths.

Chicago—Large lots are scarce among recent concrete bar awards and inquiries. A fair number of small tonnages are being booked regularly, these being for private construction. Inquiries for Mississippi river dams involving several thousand tons of bars are to be issued soon, with bids closing in August.

Boston—Reinforcing steel buying is in small lots with substantial inquiry lacking, estmated at several hundred tons for the district.

Philadelphia—A fair tonnage of reinfrocing bars are pending for sewage project No. 11, Blue Plains, D. C., on which Kaufman Construction Co., Philadelphia, is low at $22,205. Otherwise the market is quiet.

San Francisco—The largest reinforcing bar contract placed involved 289 tons for the head works of the Mad river project, Eureka, Calif. Bids have just been taken on 2450 tons for the White Point outfall sewer, Los Angeles, the largest pending project. The metropolitan water district, Los Angeles, will open bids July 23 for the placing of 2425 tons in connection with the Monrovia and San Rafael tunnels.

Seattle—Slow demand for reinforcing material is largely attributable to the strike in the lumber industries, construction being delayed until lumber is available. Tonnages pending are unimportant.

Reinforcing Steel Awards

289 tons, head works, Mad river project, Eureka, Calif., to unnamed interest.

110 tons, school addition, Quincy, Mass., to Truscon Steel Co., Youngstown, O.; through A. Piotti Co., Boston.

Reinforcing Steel Pending

2450 tons, White Point outfall sewer, Los Angeles; bids opened.

1350 tons, fishways, Bonneville, Oreg., dam; specifications by United States engineer, Portland; bids not yet called.

345 tons, steel sheet pile levee wall with appurtenant works and accessories, Monroe and West Monroe, La.; bids July 18, United States engineer, Vicksburg, Miss.

ANALYSIS

Cr.—25%

Ni.—18%

Si. — 2%

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Strip Steel

Strip Prices, Page 67

Pittsburgh—Makers of automotive parts, such as of hinges and other automotive hardware, have received advice from automobile makers as to changed sizes, and before July 15 will be purchasing their first strip steel requirements for 1936 automobile parts. Hot-rolled strip is quoted on the basis of 1.95c, Pittsburgh, and cold-rolled strip 2.60c, Pittsburgh or Cleveland. Several instances of price shading in strip have been rumored, but in general, strip buyers are more interested in seeing a stable market than price cutting.

Cleveland — Leading steel producers with a diversified list of finished products note demand for strip holding up relatively better than that for the majority of other items. Some fairly good orders were booked during the week for General Motors, evidently for completion of present models. Volume generally was slightly better than in the week preceding. No announcement has been made as to the strip tonnage required for the $6,000,000 frame order Midland Steel Products Co. booked for Chrysler, to be supplied by Otis Steel Co., but a safe estimate based on manufacturing experience is 30,000 tons or more.

Chicago—Strip demand is quiet though requirements of many consumers are holding better than had been anticipated. The automotive industry is not expected to increase its needs until production of new models is started. Further decline in strip buying between now and the low point of summer is expected to be only moderate.

New York—Narrow strip business still lags, with little definitely in sight. Some sellers expect business to drag until late summer when some impetus may be forthcoming from manufacturers of automobile accessories. Prices are steady.

Boston—Cold strip consumers are buying close to requirements, ordering frequently and stocking little.

Concrete Awards Compared

	Tons
Week ended July 6	399
Week ended June 29	6360
Week ended June 22	1,990
This week in 1934	2,422
Weekly average, 1934	4,084
Weekly average, 1935	4,493
Weekly average, June	3931
Total to date, 1934	131,453
Total to date, 1935	125,813

Material entering into the automotive industry is less active, but a widespread miscellaneous demand tends to hold operations at about the rate of late last month. Prices are firm. Imports of strip in this district last month totaled 76 tons from Sweden.

Youngstown, O.—Demand for all sizes of strip continues to be maintained not only from auto partsmakers but also from a large number of miscellaneous consumers. Wider strip continues to move in good volume to makers of automotive parts, but narrow cold-rolled strip needs continue to be pressed steadily. Good-sized tonnages of this material are being placed by light tubemakers.

Wire

Wire Prices, Page 67

Pittsburgh—Heavier demand for wire products for shipment to farm districts is a surprising development in the market and some producers through last week were booking merchant items, especially fencing, in excess of their capacity to produce. Apparently many jobbers are stocking up in anticipation of the effects of good crops. New manufacturing wire specifications are being issued by automobile makers for 1936 models. The market is firm at 2.30c, Pittsburgh, for plain manufacturing wire, $2.60 for nails, and 2.90c on spring wire.

Cleveland — Demand for farm fencing materials is holding up much better than expected, while orders for manufacturers' wire are tapering. Prices are steady.

Chicago—Demand for manufacturers' wire is fairly steady. A further reduction in requirements of important consumers is anticipated during the remainder of this month, though the outlook for the quarter is regarded as favorable. New business in merchant products is quiet though a fairly active demand is reported from distributors of fencing, barbed wire, etc. Wire prices are holding steadily.

Boston—Wire mill operations have regained ground lost during the holiday. Buying is slightly slower with manufacturers' wire, specialties and lighter products making the best showing. Mill prices are firm, but secondary sellers of wire and nails are shading quotations. From Sweden 254 tons of steel wire rods were imported in the Boston customs district last month.

Philadelphia—Tonnage of wire and wire products is tapering as demands from agricultural implement manufacturers are becoming smaller.

Youngstown, O.—Specifications for various forms of wire products have been flowing into district mills in encouraging volume, especially true of manufacturers' wire, which has shown no indication of falling off. Nails and plain wire continue slow in comparison with tonnages in former years. Jobbers are showing more interest in renewing stocks than for some time.

Metallurgical Coke

Coke Prices, Page 67

Most coke users have adequate stocks. Standard beehive furnace coke is entirely nominal at $3.40 to $3.60 a ton, Connellsville, Pa., ovens. Buyers feel confident they should not have to pay more than $3.40 a ton if they were negotiating a fair tonnage.

By-product coke specifications are in good volume in all consuming centers and shipments are at a good rate, with prices steady and unchanged.

Refractories

Refractories Prices, Page 68

Advance from $42.50 to $45 per net ton on chemically bonded chrome brick, effective July 1, has been announced by a leading producer. Other grades are unchanged.

Tin Plate

Tin Plate Prices, Page 66

Pittsburgh—Fresh releases of considerable tonnage of tin plate were issued by canmakers last week, at a time when tin plate production was being scaled down for the holiday. The better volume of canmakers' releases against heavy mill warehouse stocks has seen the latter liquidated from about 5,000,000 base boxes, as of June 1, to an estimated 4,250,000 base boxes at present. Most mills produced more tin plate in the first six months of 1935 than in all 1934. The total for the latter year was approximately 31,000,000 base box production, and this year's total will be close to 38,000,000. The market holds firmly at $5.25, Pittsburgh, per base box for tin plate, and 3.40c, Pittsburgh, on No. 24 unassorted long ternes.

Youngstown, O.—Mill managers expect the next month to be fairly active, but they point out that the usual tin plate season is approaching its decline. Demand for long ternes for automobile gasoline tanks has been good so far this year.

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Pig Iron

Pig Iron Prices, Page 68

Pittsburgh—Foundries continue to buy iron requirements in carload quantities and are paying $18.50, Pittsburgh district furnace base, for foundry and malleable iron; $18 for basic or gray forge; and, $19 on bessemer. Carnegie Steel Co. has been producing spiegeleisen in one of its Edgar Thomson furnaces, recently switched over from bessemer iron.

Cleveland—In winding up second quarter merchant pig iron contracts there was a carry-over of about 5000 tons, and this was re-entered on producers' books for third quarter, plus moderate additional tonnages from the contract consumers. Sales and shipments last week were under holiday influences. Few inquiries are in the market, although prospects for third quarter appear encouraging. Prices are unchanged.

Chicago—Spot buying of pig iron was fairly active the past week despite the holiday interruption. Operations were affected adversely but a number of consumers have only moderate stocks and found it necessary to re-enter the market. Only a moderate tonnage which was placed for shipment during the second quarter was carried over into the present period. Prices are firm.

Boston—Pig iron sales are light, although volume last month was probably the largest of the quarter, mostly in small lots. Foundry melt is down in most districts, a seasonal suspension over the holiday. Prices are unchanged for domestic iron and quotations held on approximately 100 tons for the Boston navy yard. During June imports of foreign iron dropped to 355 tons in the Boston customs district, all from India.

New York—Carlot buying continues to be the order of present pig iron business. Only in a few instances has there been any forward buying and even in these cases there have been no commitments beyond Aug. 1, so far as can be learned. Some leading sellers report June shipments about on a parity with May; in a few cases better than in May.

Philadelphia—Specifications are expected to improve following interruption from the holiday last week. Shipments this month, however, will show decrease from June, it is believed. Despite increasing foreign competition, domestic prices hold firmly.

Buffalo—The Tonawanda furnace of the American Radiator Co. is being rushed into production and will have a long run once operations are resumed. The second Republic Steel Corp. furnace also is in production so that by the end of this month there will be seven productive units here. This will be the largest number in three years or more.

Youngstown, O.—Some routine sales of various grades of pig iron are being made by valley district merchant furnaces, most of the tonnage moving comprising malleable grades.

Cincinnati—Third quarter pig iron bookings during the past week were slower, and considerable of the anticipated tonnage for the period is not under contract. Buying remains conservative. Shipments, possibly on holiday influence, are lighter, but the melt continues steady at seasonally lower levels.

St. Louis—Total shipments for June moderately exceeded those of May, and were the largest for any June since 1930. So far this month small lot purchasing has held up well. There has been some talk of an adjustment in the St. Louis delivered price on No. 2 southern iron owing to proposed changes in barge line rates. No definite announcement has been made.

Birmingham, Ala.—While the holiday interrupted the first week of the third quarter the pig iron market holds at a steady pace with prospects of improved conditions. Purchasing is in small lots with only one or two of the steady melters having iron on yards

Toronto, Ont.—The pig iron market was affected to some extent by the holiday on Monday. Local blast furnace representatives, however, state there are indications of continued activity in the market, and some look for more active buying in the near future.

Scrap

Scrap Prices, Page 69

Pittsburgh—Appearance of important railroad lists this week will determine accurately the temper of the market, trading in which last week slowed to a snail's pace. Baltimore & Ohio will close July 8 on 3000 tons of structural steel scrap and 1250 tons of No. 1 steel; Pennsylvania offers 8750 tons of No. 1 steel July 10, and the Norfolk & Western is out with a July 18 list including several thousand tons of scrap rails and 500 tons of wrought No. 3 scrap. Only the two important down-river mills in the Wheeling district were consistently in the market last week.

Chicago—Scrap remains at steady prices, with new business light. A small tonnage of heavy melting steel was placed at $10.25, substantiating the recent market. Shipments against contracts are only moderate, but with consumption well maintained a moderate tonnage of new business is in prospect for coming weeks.

Cleveland—Recent purchase of a series of individual lots of scrap of various grades, making a fair-sized aggregate tonnage, by one important steelmaker here has rather obscured the market at Youngstown and here. This, because the price paid for No.

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1 heavy steel is believed to be $12 and for No. 2 and pressed sheets $11.25. Scrap at present price levels is difficult to obtain either in Detroit, Cleveland, Youngstown or Pittsburgh. Dealers facing the current difficult situation on scrap supplies are unwilling to sell at present levels.

It is reported that a valley steelworks last week purchased 40,000 to 50,000 tons of scrap.

Boston—Brisk demand for export tends to steady scrap prices in the absence of domestic buying, the larger New England consumers taking little. Shipments to the Pennsylvania districts are also light. Heavy melting steel grades at dock are firm and unchanged.

New York—Domestic buying is light with most activity for export at unchanged prices. Several yards are tied up by strike and owners have voted an advance to 40 cents an hour minimum wage, approximately 25 per cent over the former code minimum. Unless employes return by Monday places will be filled. Some returned to work Friday. The general undertone of the market is easy, but there is little trading.

Philadelphia—Prices of steel and iron scrap are unchanged but weakness in the foreign market may affect wharf prices here. Light domestic buying includes a few hundred tons of No. 2 heavy melting steel for Pencoyd, Pa., picked up locally at about $9, delivered.

Buffalo—About 3000 tons of No. 2 heavy melting steel has been sold to a local consumer for $9.75. It is probable the buying is continuing. This is 75 cents above the last open offer of a major consumer here. Radiator plants offer $9 for stove plate without being able to pick up much tonnage. Dealers generally are asking 50 cents above consumers' offers for all grades.

Detroit—More consumer interest has been manifested in iron and steel scrap, but as yet no noteworthy sales. However, mills taking scrap from Detroit have put out feelers. An adjustment in the market is expected in a few days, probably upward. Offerings of scrap by automobile manufacturers are tapering.

Cincinnati—The iron and steel scrap market continues dull, with virtual suspension in trading interest over the holiday. Supplies for coverage on contracts are adequate, and other outlets restricted while mills disclose apathy toward new contracts.

St. Louis—Typical summer holiday dullness prevails in iron and steel scrap. Actual sales reported during the past several days consisted of a few carlots of special material, the aggregate being less that 600 tons, all for prompt shipment. Consumer stocks are beginning to show results of the steady inroads during the past two or three months, and in numerous instances replenishment can not be much longer postponed.

Milwaukee—A cargo of 3250 tons of busheling scrap has been loaded here, to be increased to 4000 tons at East Chicago, Ind., to be carried by lake to the Otis Steel Co., Cleveland. This is the second scrap cargo from Milwaukee this season.

Birmingham, Ala.—Scrap melters are buying only for immediate needs and are not interested in futures.

Seattle—Japan shows no indications of renewed buying of scrap. Domestic sales have not increased and export commitments are practically all afloat. Another tramp carrier has been chartered to haul a full cargo of scrap from California ports to Japan. Prices are weak in harmony with the general situation.

Toronto, Ont.—While local dealers continue to report good movement of steel scrap to the Hamilton district, other business during the past few days was negligible, largely due to the long holiday week-end. Interest in the iron and steel markets, however, again is picking up.

Ferroalloys

Ferroalloy Prices, Page 68

New York—While ferromanganese shipments last week reflected the holiday let-down, some leading sellers look for July business as a whole to show little, if any, decline from June. Ferroalloy prices have been reaffirmed for the third quarter.

Warehouse

Warehouse Prices, Page 70

Pittsburgh—Owing to a few fair-size specifications for jobber steel placed in this district July has started off with a favorable rate. All warehouse steel prices are firm, and both jobbers and mill supply houses are now quoting 2.80c on soft steel bars for local shipment.

Cleveland—Warehouse prices are firm. With some large sellers June tonnage was slightly ahead of that in May, while the number of orders was slightly lower. Recent sales have been fairly steady.

Chicago—Sales are in good volume, near the June rate, which was practically equal to May. Sales for the first six months were 30 per cent over the corresponding period last year. Warehouse prices are unchanged.

Boston—An easy tone prevails in the warehouse market in New England with lower prices being quoted on numerous products, in some instances 25 cents per 100 pounds lower.

Philadelphia—Buying of steel from warehouses is well sustained with prices showing no change.

Detroit—Late June having failed to develop the usual month-end lull, warehouse business in iron and steel last month held up well. More tool and die work is coming out and no reaction is looked for like last summer.

Cincinnati—Sales from warehouse during June were close to May vol-

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ume. Buying prior to the holiday for industrial needs showed no general suspension. Prices are unchanged.

St. Louis—Summer influences are reflected in a slowing down in movement of iron and steel commodities from store. Underlying sentiment, however, is strong, and present lull is looked upon as a temporary manifestation.

Seattle—June shows less volume than May in warehouse sales, due to lack of buying by the lumber industries. Sheets are in reasonable demand but lack of active construction is being felt in the wholesale field.

Iron Ore

Iron Ore Prices, Page 69

Cleveland—Lake shipments of Lake Superior iron ore in June—4,241,636 tons—were 219,171 tons, or 4.9 per cent, lower than in June last year. This season to July 1 shipments total 8,145,493 tons, 14 per cent over the same period in 1934. Little demand is noted in the open market.

Coke By-Products

Coke By-Product Prices, Page 67

New York—Sulphate of ammonia is slightly more active with buyers taking supplies for late summer and fall mixtures. Buying of distillates holds well, with current production moving directly into consumption. Phenol and naphthalene is seasonally slower and a recent government purchase of the latter brought out bids well under the going market.

Steel in Europe

Foreign Steel Prices, Page 70

London—(*By Cable*)—Great Britain sees a revival in demand for steel and iron and two additional blast furnace stacks will be lighted in the Middlesbrough district in July. Dorman, Long & Co. Ltd., Middlesbrough, have placed a contract for rolling mill electrical equipment to the value of £100,000 with General Electric Co., Schenectady, N. Y. Semifinished steel is active and demand for plates is steady. Motor-car makers continue to support the steel market by good demand. Midland foundrymen are buying pig iron extensively for last half delivery.

The Continent reports quiet export conditions. Paris finds some works are curtailing activity. Berlin reports continued improvement in semifinished steel.

Semifinished

Semifinished Prices, Page 67

Because sheet and tin bar mills required only half a week's supply of semifinished steel last week, production was reduced sharply. Forging billet and wire rod demand is expected to expand later this month, in view of renewal of automotive activity. The semifinished steel market on a Pittsburgh base remains $27 for billets, $28 for sheet bars, $38 for common wire rods, and $40 for combination rods. Alloy billets are $49, Pittsburgh, and uncropped ingots, $40.

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Nonferrous Metals

Nonferrous Metal Prices, Page 68

New York—Improved business sentiment in the copper market and an active demand for lead accompanied by an advance in prices featured the nonferrous metal markets last week.

Copper—Foreign copper prices moved steadily upward on increasing demand while the tone of the domestic market developed strength although holding to the 8.00c, Connecticut, level. Casting copper rose 25 points toward the end of the week to 7.50c. Foreign sales were made on Friday as high as 7.55c. Trade interests are centering attention on the outcome of the meeting of the foreign marketing committee at Brussels on July 15 at which representatives of two American companies will be present.

Lead—Consumers were active buyers last week and the market presented a strong appearance from day to day. Leading sellers disposed of their ore intakes without difficulty and one seller found it necessary to place inquiries on waiting lists for subsequent bookings. Leading sellers advanced the prices $1 a ton Friday to 4.05c, New York, and 3.90c, East St. Louis. St. Joseph Lead Co. quoted a $1 premium at New York.

Zinc—The tone of the market held steady and enough business was placed to hold the market at the 4.30c, East St. Louis, basis. Sales were light to moderate.

Tin—The Straits tin market displayed firmness during the week but demand was not active enough to lift prices more than fractionally, despite the strong statistical position at the end of June. The prices rose from 51.75c at the beginning of the week to 51.90c at the end.

Aluminum—Both virgin and secondary grades held unchanged and steady during the week with no buying of note reported.

Antimony—Market quiet with prices holding.

Production

(*Continued from Page 20*)

holiday shutdowns. A 35 per cent level this week is indicated in tentative schedules of leading mills.

Chicago—Declined to an average of 33 per cent for the week, due al-

most entirely to the holiday interruption. This compares with 41 per cent the previous week, and the current week is expected to see a rebound to close to the latter figure. Additional blast furnaces have been banked or blown out, leaving but 11 active steelworks stacks out of 36. A year ago 10 furnaces were in blast.

Buffalo—Down 3 points to 29 per cent, owing to general suspensions over the holiday. Eleven out of 38 open hearths are active.

Birmingham—Unchanged at 30 per cent. Expectations are for a change upward this month.

Wheeling—Off 8 points last week to 40 per cent, but scheduled for a return to the 48 per cent mark with this week, with 18 out of 37 open hearth furnaces on full schedule.

Cleveland-Lorain — Averaged 16 per cent for the week, compared with 46 per cent in the preceding week. National Tube Co., Lorain, suspended open hearth operations for the week, while Corrigan, McKinney Steel Co. suspended July 3 for the remainder of the week. This week the rate is expected to rebound to about 46 per cent.

CANADIAN IRON, STEEL OUTPUT SHOWS GAIN IN MAY

Output of steel ingots and castings in Canada in May totaled 72,811 tons, against 68,530 tons in April, and was the highest for any month since March, 1934. Five-month total was 314,713 tons, compared with 333,509 tons in the same period of 1934.

Pig iron output was 45,432 tons, compared with 43,388 tons in April. Total for the first five months was 215,222 tons, compared with 120,521 tons a year ago. Basic iron production increased from 39,850 tons in April to 42,390 tons in May, but iron of malleable grade declined from 3538 tons to 2398 tons.

Ferroalloys totaled 4978 tons, compared with 5147 tons in April, and 2556 tons in May, 1934. Five-month-total was 18,347 tons, against 9565 tons in 1934.

Transportation

FIRST solid bargeload of iron and steel scrap to be moved from St. Louis has cleared for various points in the Valley, via the Mississippi and Ohio rivers. The shipment, an experiment in scrap transportation, is being made by the Harry Benjamin Equipment Co., St. Louis, of which Fred S. Fuld is president.

Loading of the big barge, which has been in progress several days, was by means of dump trucks, which moved over the floating dock of a local river packet company. The cargo consists of 1000 tons of different grades, and is destined for Valley industries. It would require a train of 28 to 30 cars to move the material. The barge is 160 feet long, and is part of the equipment of the Ohio River Co.

E. J. & E. RIGHT TO HAUL STEEL CORP. FREIGHT UPHELD

Elgin, Joliet & Eastern railroad, subsidiary of the United States Steel Corp., on July 2 won a suit instituted more than five years ago by the government, which sought to restrain it from carrying the products of other subsidiaries of the corporation.

The ruling by Federal Judge Charles E. Woodward, at Chicago, held that the railroads is a separate corporate entity, free from the domination of the Steel corporation, although the latter owns all of its capital stock.

The suit was instituted in 1930, the injunction being based on the commodities clause of the interstate commerce act which prohibits a railroad company from transporting any interstate commerce commodities in which it has a property interest.

The court ruled that the road did not discriminate against or in favor of any of its customers in services or charges and that ownership by the holding company had not resulted in collusive rates or favoritism, and that no control over the railroad was maintained by the corporation.

The United States Supreme Court upheld the government's contention in a similar suit brought against the Reading Co., which controlled the Reading railroad, but Judge Woodward ruled that the two cases were dissimilar in that the Reading Co.'s corporate structure had been designed to circumvent the law.

Labor

ON SIGNING the Wagner labor-disputes bill July 5 President Roosevelt brought nearer a court test of this bill, framed by friends of organized labor and designed to outlaw employe representation plans.

Briefly, the law perpetuates section 7a (collective bargaining) of the recovery act, gives organized labor a franchise to organize industry, and throws severe restrictions around employers, even prohibiting advice and any assistance to so-called company unions.

It is generally understood that the first collision between an employer and the law will develop another Schechter case.

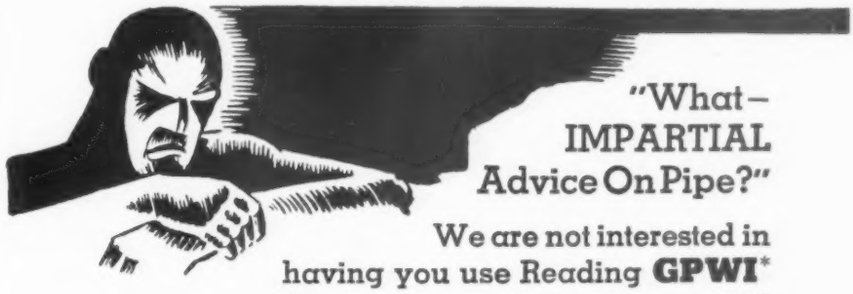
AMALGAMATED REBELS WIN

Judge Nelson McVicar, sitting in federal court at Pittsburgh last week, ruled that militant "rank and file" lodges were illegally expelled from the Amalgamated Association of Iron, Steel, and Tin Workers last Feb. 3 and must be reinstated forthwith. Judge McVicar made his ruling in a test case brought by one of the 20 expelled lodges—Riverside lodge No. 164, Cleveland, and his decision means in effect that the ousted lodges must at least be given a hearing.

ALLIS-CHALMERS OFFICE EMPLOYES BOOSTED 5%

Salaries of about 1000 office employes of the Allis-Chalmers Mfg. Co., Milwaukee, were restored to 80 per cent of the 1929 average as the result of a 5 per cent increase effective with the June pay checks.

Shop workers, it is understood, at



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present are on an hourly wage basis equal to or slightly above the hourly rates prevailing in 1929, although total weekly hours worked are not up to the level of that year. Total employment at this time is somewhat in excess of 8000, compared with about 6000 a year ago.

SHEET MILL WAGES HOLD

Wages in sheet and tin plate mills having contracts with the Amalgamated Association of Iron, Steel and in Workers will be unchanged for July and August, as the average sales price of Nos. 26, 27 and 28 gage plain sheets in May-June was 2.65c, the same as in March-April. The wage rate is 15 per cent above base.

GIVES VACATIONS WITH PAY

Youngstown Sheet & Tube Co. employes last week began vacations with pay on this basis: Men in service 10 years or more, one week with pay; men in service 5 to 10 years, 1/52 of the time worked in 1934, at full pay. Between 6500 and 7000 men will benefit. Cost to the company will be $125,000 to $150,000.

87.1 PER CENT VOTE IN EMPLOYE ELECTIONS

Of 133,370 employes of subsidiaries of the United States Steel Corp. eligible to vote for representatives at employe plan elections in June, 116,179 or 87.1 per cent participated. Over 8000 not at work on election day made special journeys to polling places. In the nominations and elections just concluded, none but employes was chosen. Details for Corporation subsidiaries follow:

Company	Number eligible to vote	Total votes cast	Per cent of number of eligibles
American Bridge	3,666	3,151	85.9
American Sheet & Tin Plate	23,677	21,030	88.8
American Steel & Wire	17,387	16,411	94.9
Cyclone & Standard Fence	432	407	94.2
Carnegie Natural Gas	395	365	92.4
Carnegie Steel	26,596	23,579	88.6
Columbia Steel	3,712	3,190	85.9
H. C. Frick Coke (where plan is in effect)	3,636	3,128	86.0
Illinois Steel	21,772	16,971	77.9
Lorain Steel	1,055	919	87.0
National Tube	15,990	14,835	92.8
Oliver Iron Mining	4,703	4,099	87.0
Tenn. Coal, Iron & R. R. (mfg. depts. only)	8,228	6,415	78.0
Universal Atlas Cement (except Northampton and Waco plants, where elections occur later)	2,121	1,679	79.2
Total	133,370	116,179	87.1

SCRAP STRIKERS GIVEN RAISE

Iron and steel scrap dealers in the New York district have offered their workers, now on strike, 40 cents an hour minimum, an increase of 7½ cents over the code rate, and a maximum work week of five 9-hour days. If strikers do not return by Monday, July 8, their places will be filled, dealers are warning.

Equipment

New York—Machine tool and equipment orders for Russian automobile plants amounting to $3,000,000 have been placed with American firms by the Amtorg Trading Corp. Included were a large number of lathes. The order is the largest for machine tools placed by Russia in several years. Purchases were made from the following: Cincinnati Milling Machine & Cincinnati Grinders Inc.; Landis Tool Co.; Fellows Gear Shaper Co.; Bryant Chucking Grinder Co.; National Automatic Tool Co.; Oilgear Co.; Gould & Eberhardt; Barnes Drill Co.; Van Norman Machine Tool Co.; Chambersburg Engineering Co.; Osborn Mfg. Co.; Leeds & Northrup Co. and National Machinery Co.

Boston—Large orders for grinding machinery, lathes and other machine tool equipment have been booked by several New England shops for Russian automobile plants. In several instances these orders will require full-time operations for several months. Inquiry from general industry is slightly heavier with buying fairly steady, generally for one or two tools at a time. An exception is a group of automatic screw machines placed with a Connecticut shop for a Detroit interest.

Chicago — Machinery and equipment demand remains spotty. Sales of certain equipment remain in fair volume, but machine tools continue slow in both orders and inquiries. The latter tendency is seasonal to a certain extent, particularly the decline in buying of small tools, but sellers still note a certain hesitancy resulting from general business uncertainty. International Harvester Co. is taking bids on a small list, including drilling and tapping tools, for its Milwaukee plant. Electro-Motive Corp. is reported to have closed on several radial drills for its new plant here. Additional price increases on machine tools are in prospect, radial drills being reported in line for an advance shortly.

Pittsburgh—Northwestern Barbed Wire Co., Sterling, Ill., has recently taken revised bids on the proposed rod mill which has been under consideration for six months or longer. As STEEL reported in February, contract for a 22-stand mill had been conditionally awarded to a leading equipment maker. However, recent developments have seen this contract cancelled and revised bids taken with a new contract for a 19-stand mill having been placed with an Eastern equipment builder. It is now understood construction will commence soon.

Seattle — Demand for mining equipment and machinery holds steady, but labor troubles in logging and lumber have slowed business in those lines. Public works projects continue to lead.

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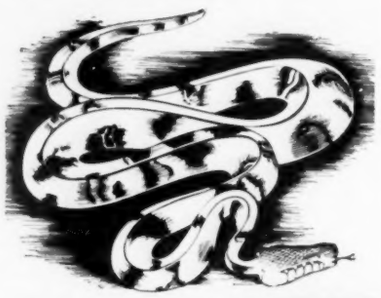

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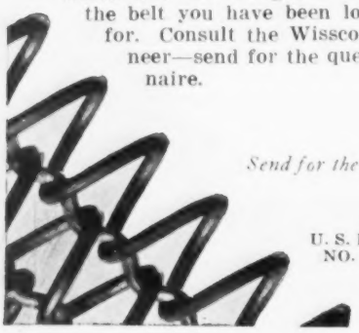

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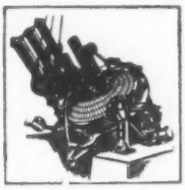

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Construction and Enterprise

Pennsylvania

BETHLEHEM, PA.—City is contemplating erecting an electric light plant which will house a generating system. PWA loan of $115,000 has been granted. R. L. Fox, 37 Broad street, engineer.

ERIE, PA.—Erie Metal Specialties Inc. has been incorporated to manufacture metals, toys, novelties and specialties, by J. D. Magenau, H. N. Plate and V. Watson.

GLENFIELD BOROUGH, PA.—PWA has approved grant of $27,818 to borough, for construction of a water and sewer system.

PHILADELPHIA — United States engineer office, Second and Chestnut streets, will take bids until July 22 for furnishing all labor and materials and performing all work for constructing a steel sheet pile jetty on south side of Wilmington Harbor, Del.

TITUSVILLE, PA.—Fisher & Young, W. S. Young manager, plans rebuilding saw mill and lumber plant, including erection of new boiler house and installation of new equipment and machinery.

Ohio

CINCINNATI—Fire severely damaged the plant of the Norwood Sash & Door Co. June 29.

EAST LIVERPOOL, O.—Hall China Co. has awarded contract to Heller Bros. Co., Youngstown, for erection of warehouse and clay shop addition, expenditures will exceed $200,000.

EDGERTON, O.—Village is considering building a municipal power plant. PWA loan of $60,000 has been granted.

HAMDEN, O.—Town has PWA grant of $19,227 for construction of waterworks system.

LIMA, O.—F. G. Smith, Lima Ice & Tool Co., is planning to erect an electric power plant, costing about $250,000. Maturity indefinite.

NEW MADISON, O.—Village has PWA grant of $18,000 for construction of complete waterworks system.

WELLSVILLE, O.—Sterling China Co. has let contract to D. F. Nellis & Sons, East Liverpool, O., for construction of an addition, as the first step in its $150,000 expansion program. A combination tunnel bisque and glost kiln will be part of the project.

Illinois

BLUFFS, ILL.—City has been allotted PWA fund of $27,409 for construction of waterworks system, consisting of pumping station and elevated storage tank.

CHICAGO—Crystal Pure Candy Co. Inc., 2611 West Chicago avenue, has plans completed and bids are being taken on a $35,000 1-story addition, 100 x 125 feet, to its plant.

CHICAGO—United Autographic Register Co., 5000 South California avenue, manufacturer of billing machines, is having plans prepared by Morton L. Pereira, architect, for two additions to its plant. Bids are now being taken.

CHICAGO — International Syphon Breaker Corp., 33 North LaSalle street, has been incorporated to manufacture, fabricate and construct pipe and pipe fittings, valves, water supply equipment and devices, by Harold H. Greenberg, Karin E. Walsh and Alford W. Dubs. Correspondent: Maxfield Weisbrod, 160 North LaSalle street.

GRAFTON, ILL.—City has been alloted PWA grant of $31,000 for construction of waterworks system.

Indiana

INDIANAPOLIS — Arko Inc., 3865 Washington boulevard, has been formed to manufacture heating, ventilating and cooling equipment, by Horace M. Arget, T. H. Komstohk, Fred A. Arget and Thomas H. Komstohk Jr.

INDIANAPOLIS—K. T. Keller, vice president and general manager, Chrysler Corp., has confirmed an announcement from Evansville, Ind., that two plants will be reopened there for the building of Plymouth cars. The plants will be equipped for assembly operations and the necessary machinery installed. Paul Sauerbrey, vice president in charge of manufacturing, will direct assembly operations.

LAPORTE, IND.—Board of public works, L. Darrow president, is drawing up preliminary plans for constructing sewage treatment plant. Cost estimated at $200,000. PWA project.

YORKTOWN, IND.—PWA grant of $20,045 has been allotted to city for construction of waterworks system, comprising a well supply, pumping station, elevated storage tank and complete distribution system.

Massachusetts

CHICOPEE, MASS.—City plans sewage disposal plant costing about $1,000,000. Application to PWA for funds has been submitted. A. N. Deroy mayor.

MILFORD, MASS.—Town, A. F. Martin, chairman sewage commission, town hall, is making plans for sewage treatment plant. Application for $91,000 has been made to PWA.

Maine

LEWISTON, ME.—Union Water Power Co. plans rebuilding burned electric power plant. Cost will exceed $30,000.

Vermont

MIDDLEBURY, VT.—Town, town clerk, City Hall, is contemplating construction of water and sewer systems.

Michigan

BATTLE CREEK, MICH.—Michigan Carton Co. has plans by Shreve, Anderson & Walker, 857 Book building, Detroit, for a 1-story power plant, to house a 1000-horsepower boiler, turbine and equipment, including erection of a 50-foot steel stack. Estimated cost $100,000.

HOWELL, MICH.—City has retained Francis Engineering Co., 323 Eddy building, Saginaw, Mich., to prepare plans and specifications for sewage disposal plant, costing about $60,000. PWA application to be filed.

New York

LONG BEACH, N. Y.—City, C. Gold mayor, plans erection of municipal light plant. E. R. Sherb, City Hall, consulting engineer.

NEW YORK— City has been granted federal funds of $11,360,250 for construction of sewage disposal plant on Ward Island. Project will consist of a treatment plant, including pump houses, pumps, administration building and heating plant.

ROME, N. Y.—Department of mental hygiene, State Office building, Albany, N. Y., has plans by W. E. Haugaard, for construction of power house here. Appropriation of $250,000 has been granted.

SIDNEY, N. Y.—Scintilla Magneto Co., Sherman avenue, will soon take bids for construction of steel factory building. Cost estimated at $45,000. Austin Co., 16112 Euclid avenue, Cleveland, engineer and architect.

New Jersey

NEWARK, N. J.—G. Krueger Brewing Co., 75 Belmont avenue, will take bids in August for erection of a brewery addition, costing about $200,000.

NEW BRUNSWICK, N. J.—City has been granted PWA funds of $263,045 for installation of approximately 20,000 lineal feet of sanitary sewers and construction of a sewage disposal plant.

TRENTON, N. J.—Department of institutions and agencies has plans by H. A. Kelly, state house, for remodeling hospital and constructing new power plant. Estimated cost $407,500.

VINELAND, N. J.—Borough commissioners have passed ordinance appropriating $300,000 for improvements to power house, including installation of a 3500-kilowatt steam turbine and generator, stokers and boilers. J. Menzone, city engineer.

Kentucky

MADISONVILLE, KY.—City will apply to PWA for $35,000 for constructing water storage tank with capacity of 250,000 gallons.

OWENSBORO, KY.—City, Fred Weir mayor, will install a $130,000 turbine at the city light plant.

TYRONE, KY.—Ripy Bros., E. Ripy president, Lawrenceburg, Ky., are planning to build a distillery with 60-barrel daily capacity, costing approximately $30,000.

Maryland

BALTIMORE—J. A. Tubler Laboratories, 423 South Hanover street, plans improvements to chemical laboratory; will expend about $30,000.

CUMBERLAND, MD.—John I. Vandegrift has contract to erect a modern bakery, replacing the burned plant of the Queen City Bread Co. Cost estimated at $50,000.

CURTIS BAY, MD.—Coast guard has applied for PWA fund of $1,673,085 for replacing buildings at depot, consisting of blacksmith shop, foundry, wood mill, pattern shop and electric system.

Georgia

GAINESVILLE, Ga.—City will vote Aug. 6 on issuing $60,000 bonds for waterworks improvements.

Florida

DAYTONA BEACH, FLA.—PWA has approved grant of $122,318 to city for improvements to waterworks system, comprising a consolidated treatment works with connecting mains and two elevated storage tanks.

FORT PIERCE, FLA.—J. V. D'Albora Co. is constructing a packing plant, 120 x 134 feet, and will install modern packing machinery.

HICORIA, FLA.—Planing mill of

(*Please turn to Page* 88)

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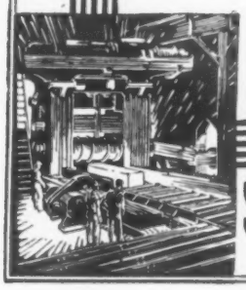

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(Concluded from Page 86)

Sherman Lumber Co. recently sustained severe damages by fire.

LIVE OAK, FLA.—City plans electric light and power plant and distribution system, costing over $40,000. J. T. Ahern, Jacksonville, Fla., architect.

MOORE HAVEN, FLA.—United States engineer office, Jacksonville, Fla., will take bids July 31 for furnishing labor, materials and constructing lock No. 2, including spillway structure and power house.

PANAMA CITY, FLA.—Muterspaugh Lumber Co.'s planing mill was damaged by fire recently.

PENSACOLA, FLA.—Hygeia Coca Cola Bottling Works Inc., T. H. Yeargin manager, will erect a $100,000 bottling plant on Palafox street. Construction will begin in about 60 days.

North Carolina

ASHEVILLE, N. C.—Automatic Coal Fireman Inc. has been incorporated with $25,000 capital by L. E. Addington and William J. Reusing, to manufacture automatic stokers.

WASHINGTON, N. C.—Moss Planing Mill Co., C. V. Swan secretary, is considering rebuilding its burned plant.

South Carolina

ABBEVILLE, S. C.—City has applied for loan and grant of $350,000 to complete Rocky River power development project.

TUCAPAU, S. C.—City has applied for PWA loan and grant of $163,820 for construction of waterworks and sewer system.

West Virginia

CHARLESTON, W. VA.—Kanawha Valley Lumber Co. is erecting a 2-story office adjacent to present building at 1311 Wilson street, and is considering plans for building a new mill and carpentry shop.

PINE GROVE, W. VA.—Town has grant of $19,636 for construction of waterworks system, comprising a well supply, pump house and pumping equipment, storage and service tanks.

Virginia

BLACKSTONE, VA.—Blackstone Weaving Co. plans erecting a power house, machine shop, etc., at its textile plant. Cost estimated at $60,000.

BUCHANAN, VA.—City has ratified proposal for $55,000 bond issue for purchase and extension of waterworks system.

GALAX, VA.—Town has submitted application to PWA for loan and grant of $582,545 for erection of power and light plant.

McCOY, VA.—Bib Vein Coal Co. is contemplating constructing a power plant and a coal handling building. Estimated cost $30,000.

Missouri

MALDEN, MO.—City has PWA grant of $45,409 for construction of a sanitary sewer system, including two sewage pumping stations and a treatment plant.

ST. LOUIS—G. C. Kern Advertising Sign Co., 2737 Washington avenue, plans erecting an addition to be used for manufacturing electric signs and fabricating sheet metal. Cost estimated at $12,000.

Arkansas

CHARLESTON, ARK.—City has PWA grant of $26,181 for construction of waterworks system, comprising a filtration plant, elevated storage tank, and complete distribution system.

Oklahoma

TULSA, OKLA.—Fred E. Cooper, 211 South Lansing street, has acquired a factory building and approximately four acres on Sand Springs road, which will be remodeled for production of special and standard Allis Chalmers equipment.

Texas

ANTON, TEX.—City, H. G. Richards mayor, has applied for PWA loan for waterworks, including well, pump, pump house, elevated tank and tower. Cost $21,000. H. N. Roberts, engineer, Lubbock, Tex.

Wisconsin

BELOIT, WIS.—Gardner Machine Co., maker of grinding machines, abrasives, etc., is extending its abrasive shop to make room for two new baking ovens. L. Waldo Thompson is president and general manager.

FORT ATKINSON, WIS.—Union Pipe Fitting Co. has been incorporated with $25,000 capital as successor to firm of same name heretofore located at Union City, Ind., but being moved to this city. B. M. Taylor is president and manager.

SUPERIOR, WIS.—Duplex Mfg. Co., South Superior, Wis., manufacturer of pumps, windmills, sawing machinery, etc., plans rebuilding of factory damaged by windstorm recently.

Minnesota

FARIBAULT, MINN.—State department administration and finance, C. R. Erickson, commissioner of purchases, 120 State street, St. Paul, has appropriation of $30,000 for remodeling power house at hospital for feeble minded, and $40,000 for power plant improvements.

MT. IRON, MINN.—Village, I. A. Blancke clerk, has voted $70,000 bonds for power plant enlargement and new equipment.

TWO HARBORS, MINN.—City plans constructing waterworks improvements, including 1,000,000-gallon storage tank, pumping station. Cost is estimated at $105,000. L. Clapper is city engineer.

WILLMAR, MINN.—State department of administration and finance, C. E. Erickson, commissioner of purchases, 120 State street, St. Paul, has appropriation of $45,000 for power plant addition to asylum here.

Iowa

AMES, IOWA—General Filter Co. has been incorporated with capital stock of $10,000 to manufacture apparatus for treating water, by Joseph Lawler president, and C. C. McCarthy secretary.

ELDORA, IOWA—City plans sewage disposal plant, including installation of equipment, auxiliaries, piping, etc. Cost $41,000. Buell & Winter, Sioux City, Iowa, engineers.

LAPORTE, IOWA—Town council will receive bids until July 9 for construction of a municipal power and light plant to cost about $100,000, including two diesel engines, generators and auxiliary equipment. Young & Stanley, Muscatine, Iowa, engineers.

Colorado

FT. COLLINS, COLO.—City will soon take bids on first section of light plant and distributing system, including installation of turbines, boilers, heaters and general equipment. Cost estimated at $750,000. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., engineer.

Idaho

IDAHO FALLS, IDAHO—City council has voted to call bids in the near future for an additional unit to the municipal power plant, for which $45,000 has been requested from the government.

Arizona

CHANDLER, ARIZ.—PWA grant of $47,250 to Chandler Heights Citrus Irrigation district has been approved for purchase of existing irrigation facilities, installation of pipe mains and power lines and construction of a booster pumping station.

Pacific Coast

PASADENA, CALIF.—City directors have submitted application to SERA for grant of $80,000 for proposed garage and machine shop building. S. B. Morris, City hall, engineer.

KENT, WASH.—King county is altering and enlarging its machine shops here.

Dominion of Canada

CAYUGA, ONT.—Dion Machine Co. Ltd., E. J. Dion manager, is preparing plans for constructing plant for manufacturing small machine tools and supplies. Cost about $40,000.

ST. DAVIDS, ONT.—Rockwood Corp. of Canada Ltd. plans constructing a plant to manufacture insulating material from rock. Estimated cost $50,000.

TORONTO, ONT.—Century Electric Devices Ltd., subsidiary of Electric Heating & Mfg. Co. Ltd., Winnipeg, has established a plant for the manufacture of water heaters and other specialties.

ARVIDA, QUE.—Aluminum Co. of Canada is constructiing a new plant at a cost of approximately $1,000,000 for treatment of bauxite.

Works Program Applications

The following are applications filed with the division of applications and information of the President's work relief program, in Washington, for allotment of funds. An application does not necessarily indicate the program will mature:

Fort Dupont, Del.—For garage and shop, $51,100; blacksmith shop, $5000.

Grand Forks, N. Dak.—For construction of power units, using local lignite to produce electricity, $50,000.

North Chicago, Ill.—To recondition sewage disposal plant at naval training station, Great Lakes, Ill., $40,000.

Rock Island, Ill.—For rehabilitation of shops, storehouses and other buildings at arsenal, $344,000.

Clearwater, Wash.—For construction of power house and accessories at naval direction finder station, Destruction island, $12,000.

Portsmouth, Va.—For construction of shop building and accessories at naval hospital, $50,000.